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INTRODUCTION

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INTRODUCTION

This Owner's Manual has been prepared with the assistance of service and engineering specialists to acquaint you with the operation and maintenance of your vehicle. It is supplemented by a Warranty Information Booklet and various customer-oriented documents. You are urged to read these publications carefully. Following the instructions and recommendations in this manual will help assure safe and enjoyable operation of your vehicle.

Sterling vehicles are equipped with various chassis and cab components. Not all of the information contained in this manual applies to every vehicle.

NOTE: After you read the manual, it should be stored in the vehicle for convenient reference and remain with the vehicle when sold, so that the new owner will be aware of all safety warnings.

When it comes to service, remember that your authorized dealer knows your vehicle best, has the factory-trained technicians and genuine Sterling® parts, and is interested in your satisfaction.

When performed on a regular basis, lubricating the parts of your vehicle is the least costly way of obtaining safe and reliable vehicle operation. Added benefits and savings occur when you check that the engine, undercarriage, and noise emission control parts are in good working order during lubrication.

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A MESSAGE FROM FREIGHTLINER LLC

Freightliner LLC and Cummins® welcome you as a Cummins® Turbo Diesel-powered truck owner.

Almost 100% of the heavy duty trucks in the United States and Canada are diesel powered because of the fuel economy, rugged durability, and high torque which permits pulling heavy loads. Cummins® engines power well over half of these trucks. Now this same technology and proven performance is yours in your new truck equipped with the Cummins® 6.7 liter, turbocharged, charge air cooled, diesel engine.

Your diesel truck will sound, feel, drive, and operate differently from a gasoline-powered truck. It is important that you read and understand this manual. You may find that some of the starting, operating, and maintenance procedures are different. However, they are simple to follow and careful adherence to them will ensure that you take full advantage of the features of this engine.

Thank you for choosing the Cummins® Turbo Diesel-powered truck.

HOW TO USE THIS MANUAL

Consult the Table of Contents to determine which section contains the information you desire.

The detailed index at the back of this Owner's Manual contains a complete listing of all subjects.

Consult the following table for a description of the symbols that may be used on your vehicle or throughout this Owner's Manual:

WATER IN FUEL
REAR WINDOW WIPER
WINDSHIELD WIPER INTERMITTENT
EXTERIOR BULB FAILURE
HIGH BEAM
TURN SIGNALS
UPPER AIR OUTLET
HEATED SEAT LOW
DOOR LOCK
ADJUSTABLE PEDALS
ELECTRONIC SPEED CONTROL
ESP BAS
ELECTRONIC STABILITY PROGRAM / BRAKE ASSIST SYSTEM
ENGINE COOLANT TEMPERATURE
HORN
FUEL
REAR WINDOW INTERMITTENT WIPER
WINDSHIELD WASHER
MASTER LIGHTING SWITCH
LOW BEAM
KEY ACTIVATE (POWER OUTLET)
UPPER AND LOWER AIR OUTLET
HEATED SEAT HIGH
WINDOW LIFT
TIRE PRESSURE MONITOR
HILL DESCENT CONTROL
BRAKE
BRAKE SYSTEM WARNING PARKING BRAKE
SRS AIRBAG
SUPPLEMENTAL RESTRAINT SYSTEM
SEE OWNER'S MANUAL ISO
FUEL FILL SIDE
REAR WINDOW WASHER
WINDSHIELD WASHER FLUID LEVEL
DOME LIGHT
FRONT FOG LIGHT
HOOD RELEASE
LOWER AIR OUTLET
RECIRCULATION
CONVERTIBLE 4 WINDOW DOWN
TRACTION CONTROL
AWD!
ALL WHEEL DRIVE
ABS
FAILURE OF ANTI-LOCK BRAKING SYSTEM
PASSENGER AIRBAG OFF
DIESEL EXHAUST BRAKE
ENGINE OIL
REAR WINDOW DEFROST
WINDSHIELD, ELECTRICALLY HEATED
PARK LIGHTS
REAR FOG LIGHT
LIFTGATE RELEASE AND LIFTGATE OPEN
DEFROST AND LOWER AIR OUTLET
VENTILATING FAN
WINDOW LOCK
ELECTRONIC THROTTLE CONTROL
4WD!
FOUR WHEEL DRIVE
BRAKE
BRAKE SYSTEM WARNING PARKING BRAKE
DOOR AJAR
CARGO LAMP
BATTERY CHARGING
HEATED MIRROR
WINDSHIELD DEFROST
INSTRUMENT PANEL ILLUMINATION
SEAT BELT
SLIDING DOOR
TRUNK / DECK RELEASE
AIR CONDITIONING
CHILD SEAT TETHER ANCHOR
VOICE RECOGNITION BUTTON
WARNING
MALFUNCTION INDICATOR LIGHT
CONVERTIBLE TOP DOWN
GLOW PLUG/ INTAKE AIR HEATER
POWER STEERING FLUID
WINDSHIELD WIPER AND WASHER
SIDE AIRBAG
AIRBAG
SLIDING DOOR
EMERGENCY RELEASE HANDLE
LIGHTER
LOWER ANCHORS AND TETHER FOR CHILDREN (LATCH)
UCONNECT® BUTTON
HAZARD
TRANS OIL TEMP
CONVERTIBLE TOP UP

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WARNINGS AND CAUTIONS

This Owner's Manual contains **WARNINGS** against operating procedures which could result in an accident or bodily injury. It also contains **CAUTIONS** against procedures which could result in damage to your vehicle. If you do not read this entire manual, you may miss important information. Observe all Warnings and Cautions.

VAN CONVERSIONS/CAMPERS

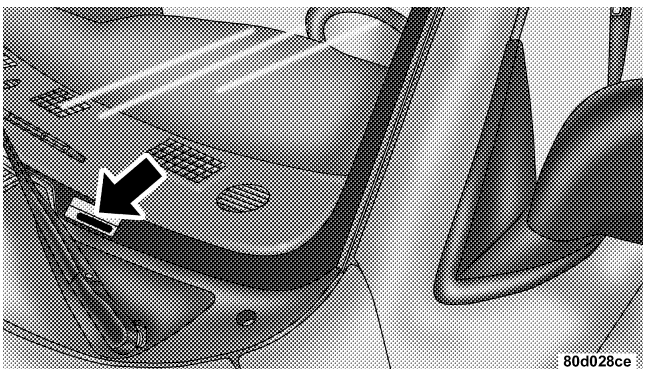
The Manufacturer's Warranty does not apply to body modifications or special equipment installed by van conversion/camper manufacturers/body builders. Refer to the Warranty information book, Section 2.1.C. Such equipment includes video monitors, VCRs, heaters, stoves, refrigerators, etc. For warranty coverage and service on these items, contact the applicable manufacturer.

Operating instructions for the special equipment installed by the conversion/camper manufacturer should also be supplied with your vehicle. If these instructions are missing, please contact your authorized selling dealer for assistance in obtaining replacement documents from the applicable manufacturer.

For information on the Body Builders Guide refer to: www.SterlingTrucks.com. This website contains dimensional and technical specifications for your vehicle. It is intended for Second Stage Manufacturer's technical support. For service issues, contact your authorized dealer.

VEHICLE IDENTIFICATION NUMBER

The Vehicle Identification Number (VIN) is found on the left front corner of the instrument panel, visible through the windshield. This number also appears on the Automobile Information Disclosure Label affixed to a window on your vehicle, the vehicle registration and title.



Vehicle Identification Number

NOTE: It is illegal to remove the VIN.

VEHICLE MODIFICATIONS/ALTERATIONS

WARNING!

Any modifications or alterations to this vehicle could seriously affect its roadworthiness and safety and may lead to an accident resulting in serious injury or death.

ENVIRONMENTAL CONCERNS AND RECOMMENDATIONS

Whenever you see instructions in this manual to discard materials, you should first attempt to reclaim and recycle them. To preserve our environment, follow appropriate environmental rules and regulations when disposing of materials.

PARTS REPLACEMENT CONSIDERATIONS

Do not replace suspension, axle, or steering parts (such as springs, wheels, hubs, and steering gears) with used parts. Used parts may have been subjected to collisions or improper use and have undetected structural damage.

EVENT DATA RECORDER

This vehicle is equipped with one or more devices that record specific vehicle data. The type and amount of data recorded varies depending on how the vehicle is equipped.

INSTALLATION OF RADIO TRANSMITTING EQUIPMENT

Special design considerations are incorporated into this vehicle's electronic system to provide immunity to radio frequency signals. Mobile two-way radios and telephone equipment must be installed properly by trained personnel. The following must be observed during installation.

The positive power connection should be made directly to the battery and fused as close to the battery as possible. The negative power connection should be made to body sheet metal adjacent to the negative battery connection. This connection should not be fused.

Antennas for two-way radios should be mounted on the roof or the rear area of the vehicle. Care should be used in mounting antennas with magnet bases. Magnets may affect the accuracy or operation of the compass on vehicles so equipped.

The antenna cable should be as short as practical and routed away from the vehicle wiring when possible. Use only fully shielded coaxial cable.

Carefully match the antenna and cable to the radio to ensure a low Standing Wave Ratio (SWR).

Mobile radio equipment with output power greater than normal may require special precautions.

All installations should be checked for possible interference between the communications equipment and the vehicle's electronic systems.

THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

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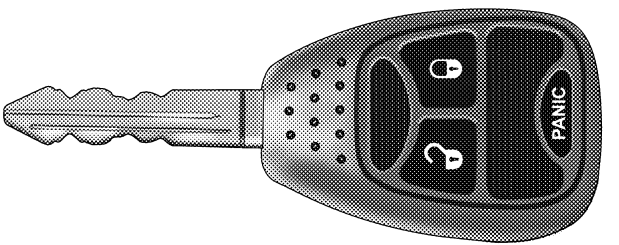
A WORD ABOUT YOUR KEYS

The authorized dealer that sold you your new vehicle has the key code numbers for your vehicle locks. These numbers can be used to order duplicate keys from your authorized dealer. Ask your authorized dealer for these numbers and keep them in a safe place.

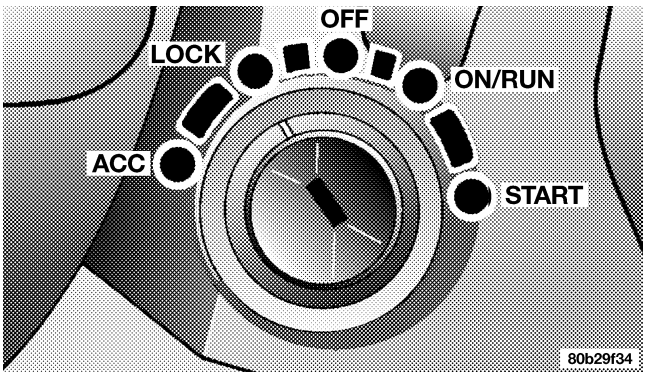


Ignition Key

Ignition Key Removal

Automatic Transmission — If Equipped

Place the shift lever in PARK. Turn the ignition switch to the LOCK position, and remove the key.



Ignition Switch Positions

NOTE: If you try to remove the key before you place the shift lever in PARK, the key may become trapped temporarily in the ignition cylinder. If this occurs, rotate the key to the right slightly, then remove the key as described. If a malfunction occurs, the system will trap the key in the ignition cylinder to warn you that this safety feature is inoperable. The engine can be started and stopped but the key cannot be removed until you obtain service.

NOTE: For vehicles not equipped with the Electronic Vehicle Information Center (EVIC), the power window switches, radio, hands–free system (if equipped), and power outlets will remain active for 10 minutes after the ignition switch is turned off. Opening either front door will cancel this feature.

For vehicles equipped with the Electronic Vehicle Information Center (EVIC), the time for this feature is programmable. Refer to "Personal Settings (Customer Programmable Features)/KEY OFF POWER DELAY > OFF" under "Electronic Vehicle Information Center (EVIC)" in Section 3.

WARNING!

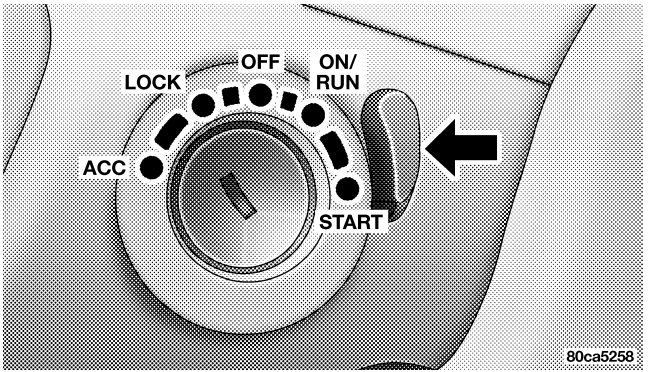
Never leave children alone in a vehicle. Leaving unattended children in a vehicle is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Don't leave the keys in the ignition. A child could operate power windows, other controls, or move the vehicle.

CAUTION!

An unlocked car is an invitation to thieves. Always remove key from the ignition and lock all doors when leaving the vehicle unattended.

Manual Transmission — If Equipped

When the steering wheel is in the LOCK position, the steering and ignition systems are locked to provide antitheft protection for your vehicle. It may be difficult to turn the key from the LOCK position when starting your vehicle. Move the steering wheel left and right while turning the key until it turns easily. To remove the key, depress and hold the release button located between the ignition switch and the instrument panel. Turn the ignition key to LOCK and remove the key.



Ignition Key Release Button

Locking Doors With The Key

You can insert the key with either side up. To lock the door, turn the key rearward; to unlock the door, turn the key forward. For external door lock lubrication, refer to "Body Lubrication" in Section 7.

SENTRY KEY®

The Sentry Key® Immobilizer System prevents unauthorized vehicle operation by disabling the engine. The system does not need to be armed or activated. Operation is automatic, regardless of whether the vehicle is locked or unlocked.

The system uses ignition keys that have an embedded electronic chip (transponder) to prevent unauthorized vehicle operation. Therefore, only keys that are programmed to the vehicle can be used to start and operate the vehicle. The system will shut the engine off in two seconds if someone uses an invalid key to try to start the engine.

NOTE: A key that has not been programmed is also considered an invalid key, even if it is cut to fit the ignition switch lock cylinder for that vehicle.

During normal operation, after turning on the ignition switch, the Vehicle Security Alarm Indicator Light will turn on for three seconds for a bulb check. If the light remains on after the bulb check, it indicates that there is a problem with the electronics. In addition, if the light begins to flash after the bulb check, it indicates that someone used an invalid key to try to start the engine. Either of these conditions will result in the engine being shut off after two seconds.

If the Vehicle Security Alarm Indicator Light turns on during normal vehicle operation (vehicle running for longer than 10 seconds), it indicates that there is a fault in the electronics. Should this occur, have the vehicle serviced as soon as possible.

NOTE:

- The Sentry Key® Immobilizer System is not compatible with some aftermarket remote starting systems. Use of these systems may result in vehicle starting problems and loss of security protection.

- Exxon/Mobil Speedpass™, additional Sentry Keys®, or any other transponder-equipped components on the same key chain will **not** cause a key-related (transponder) fault unless the additional part is **physically held against the ignition key** being used when starting the vehicle. Cell phones, pagers, or other RF electronics will not cause interference with this system.

All of the keys provided with your new vehicle have been programmed to the vehicle electronics.

Replacement Keys

NOTE: Only keys that are programmed to the vehicle electronics can be used to start and operate the vehicle. Once a Sentry Key® is programmed to a vehicle, it cannot be programmed to any other vehicle.

CAUTION!

Always remove the Sentry Keys® from the vehicle and lock all doors when leaving the vehicle unattended.

At the time of purchase, the original owner is provided with a four-digit Personal Identification Number (PIN). Keep the PIN in a secure location. This number is required for authorized dealer replacement of keys. Duplication of keys may be performed at an authorized dealer or by following the customer key programming procedure. This procedure consists of programming a blank key to the vehicle electronics. A blank key is one that has never been programmed.

NOTE: When having the Sentry Key® Immobilizer System serviced, bring all vehicle keys with you to an authorized dealer.

Customer Key Programming

If you have two valid Sentry Keys®, you can program new Sentry Keys® to the system by performing the following procedure:

1. Cut the additional Sentry Key® Transponder blank(s) to match the ignition switch lock cylinder key code.

2. Insert the first valid key into the ignition switch. Turn the ignition switch to the ON position for at least three seconds, but no longer than 15 seconds. Then, turn the ignition switch to the LOCK position and remove the first key.

3. Insert the second valid key into the ignition switch. Turn the ignition switch to the ON position within 15 seconds. After 10 seconds, a chime will sound. In addition, the Vehicle Security Alarm Indicator Light will begin to flash. Turn the ignition switch to the LOCK position and remove the second key.

4. Insert a blank Sentry Key® into the ignition switch. Turn the ignition switch to the ON position within 60 seconds. After 10 seconds, a single chime will sound. In addition, the Vehicle Security Alarm Indicator Light will stop flashing. To indicate that programming is complete, the Vehicle Security Alarm Indicator Light will turn on again for three seconds and then turn off.

The new Sentry Key® is programmed. **The Remote Keyless Entry (RKE) transmitter will also be programmed during this procedure.**

Repeat this procedure to program up to eight keys. If you do not have a programmed Sentry Key®, contact your authorized dealer for details.

NOTE: If a programmed key is lost, see your authorized dealer to have all remaining keys erased from the system's memory. This will prevent the lost key from starting your vehicle. The remaining keys must then be reprogrammed. All vehicle keys must be taken to an authorized dealer at the time of service to be reprogrammed.

General Information

The Sentry Key® system complies with FCC rules Part 15 and with RSS-210 of Industry Canada. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference that may be received, including interference that may cause undesired operation.

STEERING WHEEL LOCK — IF EQUIPPED

Your vehicle may be equipped with a passive steering wheel lock. This lock prevents steering the vehicle without the ignition key. If the steering wheel is moved no more than one-half turn in either direction and the key is not in the ignition switch, the steering wheel will lock.

If You Wish To Manually Lock The Steering Wheel:

With the engine running, turn the steering wheel upside down, turn off the engine and remove the key. Turn the steering wheel slightly in either direction until the lock engages.

To Release The Steering Wheel Lock:

Insert the key in the ignition switch and start the engine. If the key is difficult to turn, move the wheel slightly to the right or left to disengage the lock.

NOTE: If you turned the wheel to the right to engage the lock, you must turn the wheel slightly to the right to

disengage it. If you turned the wheel to the left to engage the lock, turn the wheel slightly to the left to disengage it.

Automatic Transmission Ignition Interlock System

This system prevents the key from being removed unless the shift lever is in PARK. It also prevents shifting out of PARK unless the key is in the ON position, and the brake pedal is depressed.

SECURITY ALARM SYSTEM — IF EQUIPPED

This system monitors the vehicle doors and ignition for unauthorized operation. When the alarm is activated, the system provides both audible and visible signals. For the first three minutes the horn will sound and the headlights and security telltale will flash repeatedly. For an additional 15 minutes only, the headlights and security telltale will flash. The engine will run only if a valid Sentry Key® is used to start the vehicle. Use of the Sentry Key® will disable the alarm.

Rearming of the System:

The Security Alarm System will rearm itself after the 15 additional minutes of headlights and security telltale flashing, if the system has not been disabled. If the condition which initiated the alarm is still present, the system will ignore that condition and monitor the remaining doors and ignition.

To Set the Alarm

The alarm will set when you use the power door locks, or use the Remote Keyless Entry (RKE) Transmitter to LOCK the doors. After all the doors are locked and closed, the SECURITY light in the instrument cluster will flash rapidly to signal that the system is arming. The SECURITY light in the instrument panel cluster will flash rapidly for about 16 seconds to indicate that the alarm is being set. After the alarm is set, the SECURITY light will flash at a slower rate to indicate that the system is armed.

NOTE: If the SECURITY light stays on continuously during vehicle operation, have the system checked by an authorized dealer.

To Disarm the System:

Use the RKE transmitter to UNLOCK the door. If something has triggered the system in your absence, the horn will sound three times when you unlock the doors and the SECURITY light will flash for 30 seconds. Check the vehicle for tampering.

The Security Alarm System will also disarm if the vehicle is started with a programmed Sentry Key®. If an unprogrammed Sentry Key® is used to start a vehicle, the engine will run for two seconds and then the Security Alarm will be initiated. To exit the alarming mode, press the RKE UNLOCK button, or start the vehicle with a programmed Sentry Key®.

The Security Alarm System is designed to protect your vehicle; however, you can create conditions where the system will arm unexpectedly. If you remain in the vehicle and lock the doors with the RKE transmitter, the alarm will sound when you pull the door handle to exit. The door will be locked, but the Security Alarm System will not arm.

ILLUMINATED ENTRY SYSTEM — IF EQUIPPED

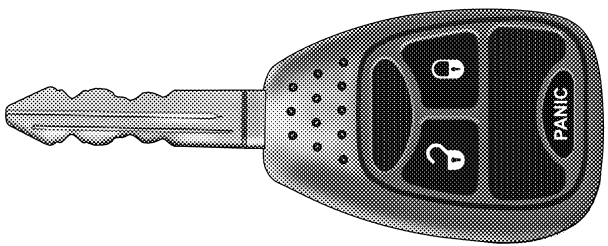
The courtesy lights will turn on when you use the Remote Keyless Entry (RKE) Transmitter or open the doors. This feature is only available if you have Remote Keyless Entry.

The lights will fade to off after about 30 seconds, or they will immediately fade to off once the ignition switch is turned ON.

NOTE:

- The front courtesy overhead console and door courtesy lights do not turn off if the dimmer control is in the interior lights ON position (extreme top position).
- The illuminated entry system will not operate if the dimmer control is in the extreme downward position.

REMOTE KEYLESS ENTRY — IF EQUIPPED



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Three-Button Transmitter

This system allows you to lock or unlock the doors from distances up to about 23 ft (7 m) using a hand-held radio transmitter. The transmitter need not be pointed at the vehicle to activate the system.

To unlock the doors:

Press and release the UNLOCK button on the Remote Keyless Entry (RKE) transmitter once to unlock only the driver's door or twice to unlock all the doors. When the UNLOCK button is pressed, the illuminated entry will initiate, the parking lights will flash on twice and if installed, the cargo lamp will turn on for 30 seconds.

The system can be programmed to unlock all the doors or the driver's door only upon the first UNLOCK button press by using the following procedure:

- For vehicles equipped with the Electronic Vehicle Information Center (EVIC), refer to "Personal Settings (Customer Programmable Features)" under "Overhead Console with Electronic Vehicle Information Center (EVIC) – If Equipped" in Section 3.
- For vehicles not equipped with the EVIC, perform the following procedure:

1. Perform this operation while standing outside the vehicle.
2. Press and hold the LOCK button on your RKE transmitter.
3. Continue to hold the LOCK button at least four seconds, but no longer than 10 seconds, then press and hold the UNLOCK button while still holding the LOCK button.
4. Release both buttons at the same time.
5. This will enable you to unlock all doors on the first press of the UNLOCK button.
6. To reactivate this feature, repeat the above steps.

To lock the doors:
Press and release the LOCK button on the RKE transmitter to lock all doors. If the ignition is OFF when the doors are locked, the parking lights will flash on once and the horn will chirp once.

Park Lights Flash Feature Programming
Vehicles will be shipped from the assembly plants with the park light flash feature activated. If desired, this feature can be disabled by using the following procedure:

- For vehicles equipped with the Electronic Vehicle Information Center (EVIC), refer to "Personal Settings (Customer Programmable Features)" under "Overhead Console with Electronic Vehicle Information Center (EVIC) – If Equipped" in Section 3.
- For vehicles not equipped with the EVIC, perform the following procedure:

1. Perform this operation while standing outside the vehicle.
2. Press and hold the UNLOCK button on a programmed (i.e., functional) RKE transmitter.
3. Continue to hold the UNLOCK button, wait at least four seconds, but no longer than 10 seconds, then press and hold the LOCK button. Release both buttons at the same time.
4. To reactivate this feature, repeat the above steps.

Horn Chirp Feature Programming
The horn chirp feature will be shipped from the assembly plants activated. If desired, this feature can be disabled by using the following procedure:

- For vehicles equipped with the Electronic Vehicle Information Center (EVIC), refer to "Personal Settings (Customer Programmable Features)" under "Overhead Console with Electronic Vehicle Information Center (EVIC) – If Equipped" in Section 3.

- For vehicles not equipped with the EVIC, perform the following procedure:

1. Perform this operation while standing outside the vehicle.

2. Press and hold the LOCK button on a programmed (i.e., functional) RKE transmitter.

3. Continue to hold the LOCK button, wait at least four seconds, but no longer than 10 seconds, then press and hold the PANIC button. Release both buttons at the same time.

4. To reactivate this feature, repeat the above steps.

Using the PANIC Alarm

To activate the PANIC mode, while the ignition is OFF, press and release the PANIC button on the RKE transmitter once. When the PANIC mode is activated, the interior lights will illuminate, the headlights and parking lights will flash, and the horn will sound.

To cancel the PANIC mode, press and release the PANIC button on the RKE transmitter a second time, after five seconds. PANIC mode will automatically cancel after three minutes or if the vehicle is started and exceeds 15 mph (25 km/h). During the PANIC mode, the door locks and remote keyless entry systems will function normally. PANIC mode will not disarm the Security System on vehicles so equipped.

General Information

This device complies with part 15 of FCC rules and with RS-210 of Industry Canada. Operation is subject to the following conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference that may be received including interference that may cause undesired operation.

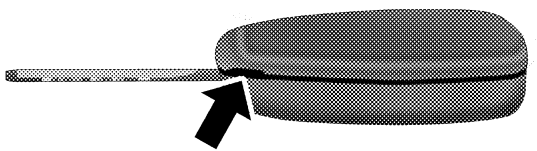
NOTE: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

If your Remote Keyless Entry Transmitter fails to operate from a normal distance, check for these two conditions:

1. Weak batteries in transmitter. The expected life of the batteries is from one to two years.

2. Closeness to a radio transmitter, such as a radio station tower, airport transmitter, and some mobile or CB radios.

Transmitter Battery Service



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RKE Transmitter Battery Replacement

NOTE: Perchlorate Material – special handling may apply, refer to www.dtsc.ca.gov/hazardouswaste/perchlorate.

The recommended replacement battery is CR2032 battery.

NOTE: Do not touch the battery terminals that are on the back housing or the printed circuit board.

1. With the transmitter buttons facing down, remove the small screw, and separate the two halves of the transmitter. Make sure not to damage the rubber gasket during removal.

2. Remove and replace the battery. When replacing the battery, match the + sign on battery to the + sign on the inside of the battery clip, located on back cover. Avoid touching the new battery with your fingers. Skin oils may cause battery deterioration. If you touch a battery, clean it with rubbing alcohol.

3. To reassemble the transmitter case, snap the two halves of the case together. Make sure there is an even "gap" between the two halves. If equipped, install and tighten the screw until snug. Test transmitter operation.

DOOR LOCKS

Manual Door Locks — If Equipped

Front and rear doors may be locked by moving the lock plunger up or down.

All doors may be opened with the inside door handle without lifting the lock plunger. Doors locked before closing will remain locked when closed.

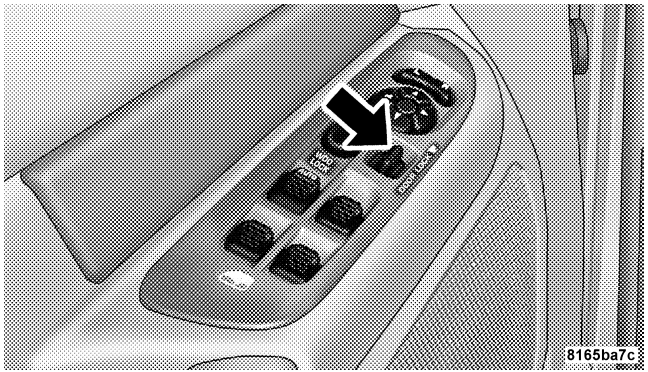
The ignition key will unlock all the locks on your vehicle.

WARNING!

- **For personal security and safety in the event of an accident, lock the vehicle doors when you drive as well as when you park and leave the vehicle.**
- **Never leave children alone in a vehicle. Leaving unattended children in a vehicle is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Don't leave the keys in the ignition. A child could operate power windows, other controls, or move the vehicle.**

Power Door Locks — If Equipped

A power door lock switch is on each front door trim panel. Use this switch to lock or unlock the doors.



Power Door Lock Switch Location

If you press the power door lock switch while the key is in the ignition, and any front door is open, the power locks will not operate. This prevents you from accidentally locking your keys in the vehicle. Removing the key or closing the door will allow the locks to operate. A

chime will sound if the key is in the ignition switch and a door is open, as a reminder to remove the key.

Automatic Door Locks – If Equipped
If this feature is enabled, your door locks will lock automatically when the vehicle's speed exceeds 15 mph (25 km/h).

Automatic Door Lock Programming
This feature is enabled when your vehicle is shipped from the assembly plant and can be disabled by using the following procedure:

- For vehicles equipped with the Electronic Vehicle Information Center (EVIC), refer to "Personal Settings (Customer Programmable Features)" under "Overhead Console with Electronic Vehicle Information Center (EVIC) – If Equipped" in Section 3.
- For vehicles not equipped with the EVIC, perform the following procedure:

1. Enter your vehicle and close all doors.
2. Fasten your seat belt. (Fastening the seat belt will cancel any chiming that may confuse you during this programming procedure.)
3. Place the key into the ignition.
4. Within 15 seconds cycle the key from the LOCK position to the ON/RUN position a minimum of four times, ending in the LOCK position **(do not start the engine).**
5. Within 30 seconds, press the driver's door lock switch in the LOCK direction.
6. A single chime will be heard to indicate the feature has been disabled.
7. To reactivate this feature, repeat the above steps.

8. If a chime is not heard, the program mode was canceled before the feature could be disabled. If necessary, repeat the above procedure.

Auto Unlock On Exit — If Equipped
This feature unlocks all of the doors of the vehicle when any door is opened. This will occur only after the vehicle has been shifted into the PARK position after the vehicle has been driven (shifted out of PARK and all doors closed).

Auto Unlock On Exit Programming — If Equipped
Customer programming sequence to enable or disable the Auto Unlock Feature:

- For vehicles equipped with the Electronic Vehicle Information Center (EVIC), refer to "Personal Settings (Customer Programmable Features)" under "Overhead Console with Electronic Vehicle Information Center (EVIC) – If Equipped" in Section 3.
- For vehicles not equipped with the EVIC, perform the following procedure:

1. Enter your vehicle and close all doors.

2. Fasten your seat belt. (fastening the seat belt will cancel any chimes that may be confusing during this programming procedure.)

3. Insert the key into the ignition.

4. Within 15 seconds, cycle the key from the LOCK position to the ON/RUN position a minimum of four times, ending in the LOCK position **(do not start the engine)**.

5. Within 30 seconds, press the driver's door lock switch in the UNLOCK direction.

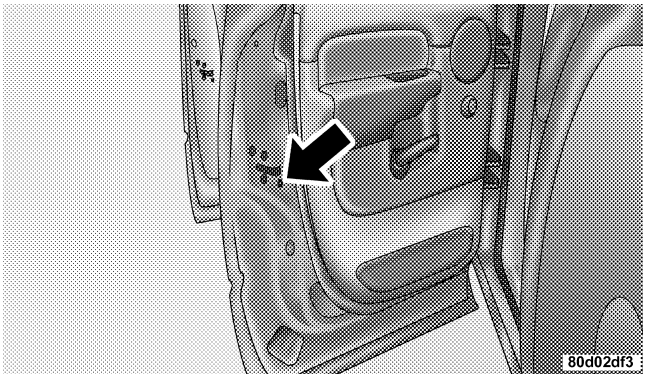
6. A single chime will sound to indicate the feature has been changed.

7. Repeat the above steps to alternate the availability of this feature.

8. If a chime is not heard, the program mode was canceled before the feature could be changed. If necessary, repeat the above procedure.

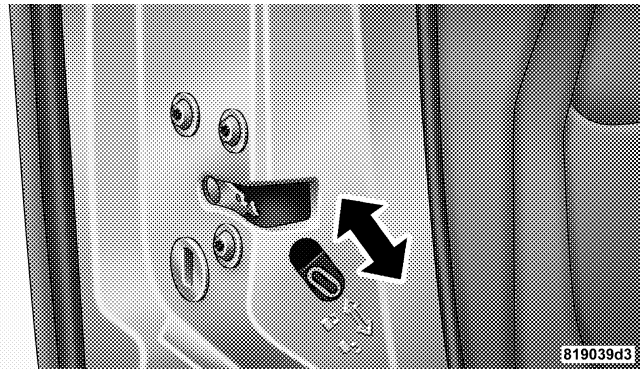
Child Protection Door Lock

To provide a safer environment for children riding in the rear seat, the rear doors of your vehicle have the child protection door lock system.



Child Protection Door Lock Location

To use the system, open each rear door, slide the lever UP to engage the locks and DOWN to disengage the child protection locks. When the system on a door is engaged, that door can only be opened by using the outside door handle even if the inside door lock is in the unlocked position.



Child Lock Control

WARNING!

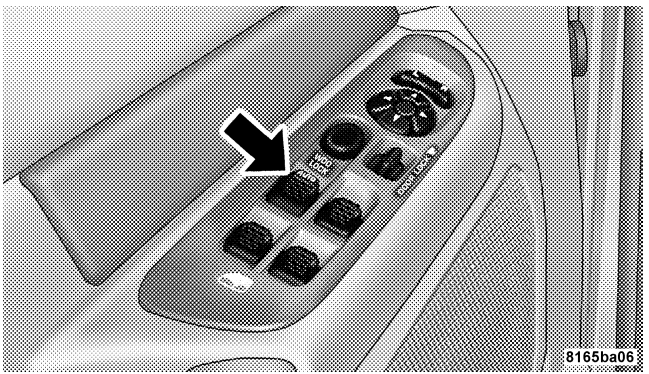
Avoid trapping anyone in a vehicle in a collision. Remember that the rear doors can only be opened from the outside when the child protection locks are engaged.

NOTE: After setting the child protection door lock system, always test the door from the inside to make certain it is in the desired position.

NOTE: For emergency exit with the system engaged, move the door lock switch to the UNLOCK position, roll down the window and open the door with the outside door handle.

WINDOWS

Power Windows – If Equipped



Power Window Switches

The control on the left front door panel has up-down switches that give you fingertip control of all power windows. There is a single opening and closing switch on the front passenger door for passenger window control and on the rear doors of Quad Cab® models. The windows will operate when the ignition switch is turned to the ON or ACC (Accessory) position and for ten minutes after the ignition is turned OFF or a front door is opened.

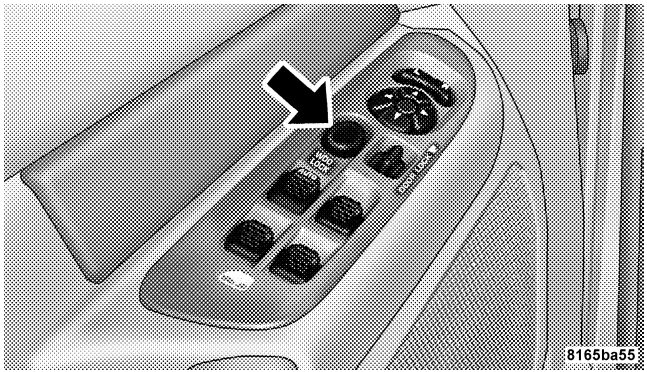
NOTE: The Power Accessory Delay feature will allow the power windows to operate for 10 minutes after the ignition is turned OFF.

WARNING!

Never leave children alone in a vehicle. Leaving unattended children in a vehicle is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Don't leave the key in the ignition. A child could operate power windows, other controls, or move the vehicle.

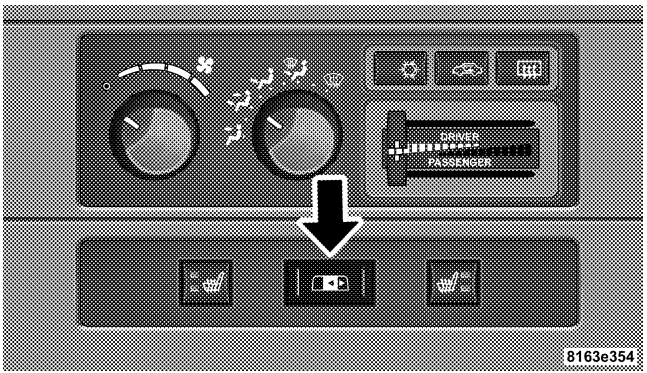
Auto Down (Driver's Side Only)
The driver's window switch has an Auto Down feature. Press the window switch past the detent, release, and the window will go down automatically.

Window Lockout Switch (4-Door Models Only)
The window lockout switch on the driver's door allows you to disable the window control on the other doors. To disable the window controls on the other doors, press the window lockout switch. To enable the window controls, press the window lockout switch again.



Window Lockout Switch

Power Sliding Rear Window – If Equipped



Power Sliding Rear Window Switch

The power sliding rear window switch is located on the instrument panel below the climate controls. Press the right side of the switch to open the glass and the left side of the switch to close the glass.

Sliding Rear Window – If Equipped

A locking device in the center of the window helps to prevent entry from the rear of the vehicle. Squeeze the lock to release the window.

Wind Buffeting

Wind buffeting can be described as the perception of pressure on the ears or a helicopter type sound in the ears. Your vehicle may exhibit wind buffeting with the windows down or in partially open positions. This is a normal occurrence and can be minimized. If the buffeting occurs with the rear windows open, open the front and rear windows together to minimize the buffeting.

OCCUPANT RESTRAINTS

Some of the most important safety features in your vehicle are the restraint systems. These include the front and rear seat belts for the driver and all passengers, and front airbags for both the driver and front passenger. If you will be carrying children too small for adult-size belts, your seat belts also can be used to hold infant and child restraint systems.

Please pay close attention to the information in this section. It tells you how to use your restraint system properly to keep you and your passengers as safe as possible.

WARNING!

In a collision, you and your passengers can suffer much greater injuries if you are not properly buckled up. You can strike the interior of your vehicle or other passengers, or you can be thrown out of the vehicle. Always be sure you and others in your vehicle are buckled up properly.

Buckle up even though you are an excellent driver, even on short trips. Someone on the road may be a poor driver and cause a collision that includes you. This can happen far away from home or on your own street.

Research has shown that seat belts save lives, and that they can reduce the seriousness of injuries in a collision. Some of the worst injuries happen when people are thrown from the vehicle. Seat belts reduce the possibility of ejection and the risk of injury caused by striking the inside of the vehicle. **Everyone** in a motor vehicle should be belted at all times.

Lap/Shoulder Belts

All seating positions except the Quad Cab® front center seating position have combination lap/shoulder belts. The belt webbing retractor is designed to lock during very sudden stops or collisions. This feature allows the shoulder part of the belt to move freely with you under normal conditions. But in a collision, the belt will lock and reduce the risk of your striking the inside of the vehicle or being thrown out.

WARNING!

It is extremely dangerous to ride in a cargo area, inside or outside of a vehicle. In a collision, people riding in these areas are more likely to be seriously injured or killed.

Do not allow people to ride in any area of your vehicle that is not equipped with seats and seat belts.

Be sure everyone in your vehicle is in a seat and using a seat belt properly.

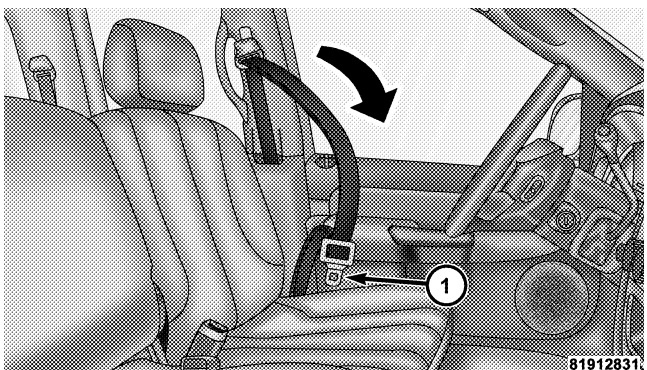
WARNING!

- **Wearing a seat belt incorrectly is dangerous. Seat belts are designed to go around the large bones of your body. These are the strongest parts of your body and can take the forces of a collision best. Wearing your belt in the wrong place could make your injuries in a collision much worse. You might suffer internal injuries, or you could even slide out of part of the belt. Follow these instructions to wear your seat belt safely and to keep your passengers safe, too.**
- **Two people should never be belted into a single seat belt. People belted together can crash into one another in an accident, hurting one another badly. Never use a lap/shoulder belt or a lap belt for more than one person, no matter what their size.**

Lap/Shoulder Belt Operating Instructions

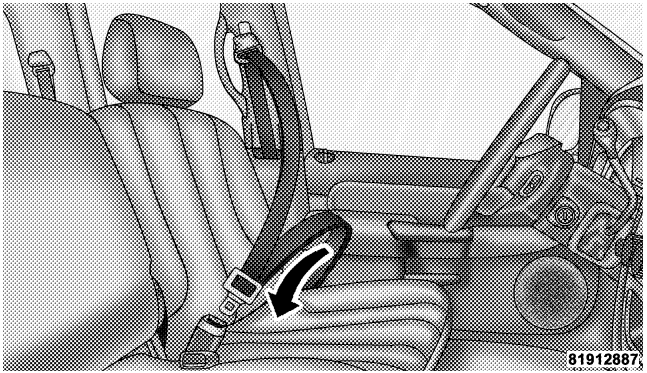
1. Enter the vehicle and close the door. Sit back and adjust the seat.

2. The seat belt latch plate is above the back of the front seat, next to your arm in the rear seat. Grasp the latch plate and pull out the belt. Slide the latch plate up the webbing as far as necessary to allow the belt to go around your lap.



1 — Latch Plate

3. When the belt is long enough to fit, insert the latch plate into the buckle until you hear a “click.”



Latch Plate To Buckle

WARNING!

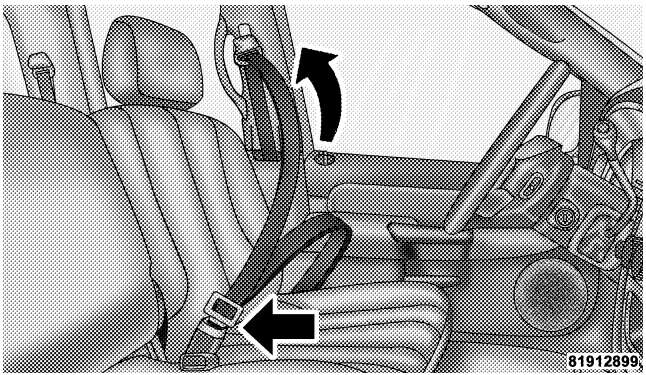
• A belt buckled into the wrong buckle will not protect you properly. The lap portion could ride too high on your body, possibly causing internal injuries. Always buckle your belt into the buckle nearest you.

• A belt that is too loose will not protect you as well. In a sudden stop you could move too far forward, increasing the possibility of injury. Wear your seat belt snugly.

• A belt that is worn under your arm is very dangerous. Your body could strike the inside surfaces of the vehicle in a collision, increasing head and neck injury. And a belt worn under the arm can cause internal injuries. Ribs aren’t as strong as shoulder bones. Wear the belt over your shoulder so that your strongest bones will take the force in a collision.

• A shoulder belt placed behind you will not protect you from injury during a collision. You are more likely to hit your head in a collision if you do not wear your shoulder belt. The lap and shoulder belt are meant to be used together.

4. Position the lap belt across your thighs, below your abdomen. To remove slack in the lap belt portion, pull up on the shoulder belt. To loosen the lap belt if it is too tight, tilt the latch plate and pull on the lap belt. A snug belt reduces the risk of sliding under the belt in a collision.



Removing Slack From Belt

WARNING!

• A lap belt worn too high can increase the risk of internal injury in a collision. The belt forces won't be at the strong hip and pelvic bones, but across your abdomen. Always wear the lap belt as low as possible and keep it snug.

• A twisted belt can't do its job as well. In a collision it could even cut into you. Be sure the belt is straight. If you can't straighten a belt in a vehicle, take it to your authorized dealer and have it fixed.

5. Position the shoulder belt on your chest so that it is comfortable and not resting on your neck. The retractor will withdraw any slack in the belt.

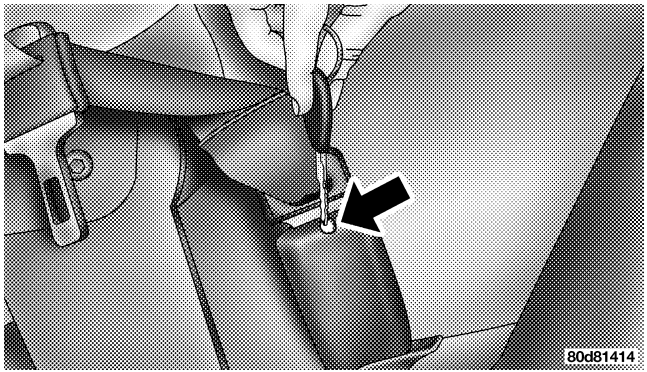
6. To release the belt, push the red button on the buckle. The belt will automatically retract to its stowed position. If necessary, slide the latch plate down the webbing to allow the belt to retract fully.

WARNING!

A frayed or torn belt could rip apart in a collision and leave you with no protection. Inspect the belt system periodically, checking for cuts, frays, or loose parts. Damaged parts must be replaced immediately. Do not disassemble or modify the system. Seat belt assemblies must be replaced after a collision if they have been damaged (bent retractor, torn webbing, etc.) or if the airbag deployed.

Regular Cab Front Center Three Point Belt

1. The front center seat belt on the Regular Cab may be disconnected to open up utilization of the storage areas behind the front seats. The black latch plate can be detached from the black keyed seat belt buckle located on the inboard side of the passenger seat. Insert the vehicle ignition key into the center white slot on the black buckle. The black buckle latch plate can be removed when the key is pressed into the buckle. Allow the retractor to take up the surplus webbing, and the buckles will hang vertically from the cab back exit bezel, thus freeing up all the area behind the front seats.

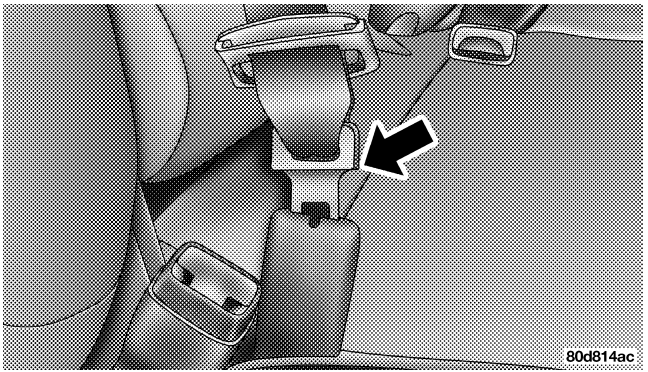


Detaching Buckle With Key

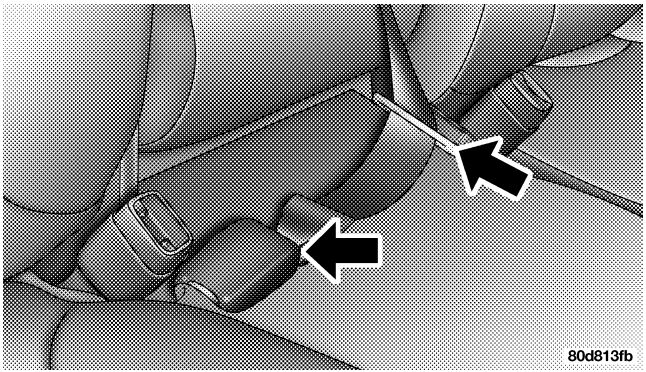
2. To reattach the seat belt to the front center seat, pull the black buckle latch plate forward from the cab back panel and insert it into the black keyed buckle until there is an audible “click”. For proper seatbelt usage, refer “Lap/Shoulder Belt Operating Instructions” in this section.

WARNING!

- **If the black latch and black buckle are not properly connected when the seat belt is used by an occupant, the seat belt will not be able to provide proper restraint and will increase the risk of injury in a collision.**
- **When reattaching the black latch and black buckle, ensure the seat belt webbing is not twisted. If the webbing is twisted, follow the preceding procedure to detach the black latch and black buckle, untwist the webbing, and reattach the black latch and black buckle.**



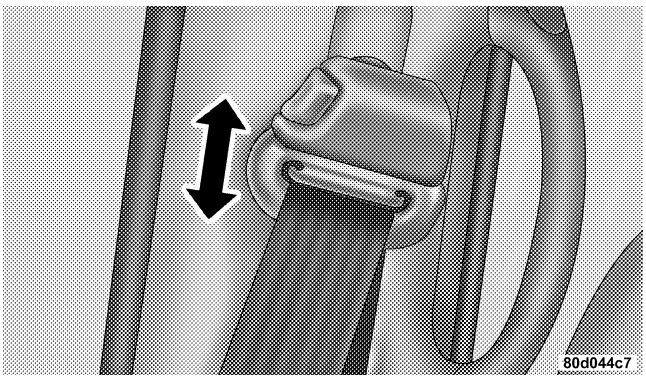
Inserting Latch Plate



In Use Position

Adjustable Upper Shoulder Belt Anchorage

In the front row outboard seats, the shoulder belt can be adjusted upward or downward to help position the belt away from your neck. Press the button located on the upper belt guide, and then move it up or down to the position that fits you best.



Adjusting Upper Shoulder Belt

As a guide, if you are shorter than average you will prefer a lower position, and if you are taller than average you'll prefer a higher position. When you release the anchorage, try to move it up or down to make sure that it is locked in position.

Automatic Locking Restraint (ALR) Mode – If Equipped

In this mode, the shoulder belt is automatically prelocked. The belt will still retract to remove any slack in the shoulder belt. The automatic locking mode is available on all passenger seating positions with a combination lap/shoulder belt.

When To Use The Automatic Locking Mode

Use the automatic locking mode any time a child safety seat is installed in a passenger seating position. Children 12 years old and under should be properly restrained in the rear seat whenever possible.

How To Use The Automatic Locking Mode

1. Buckle the combination lap/shoulder belt.
2. Grasp the shoulder portion and pull downward until the entire belt is extracted.
3. Allow the belt to retract. As the belt retracts, you will hear a clicking sound. This indicates the safety belt is now in the automatic locking mode.

How To Disengage The Automatic Locking Mode

Disconnect the combination lap/shoulder belt and allow it to retract completely to disengage the automatic locking mode and activate the vehicle sensitive (emergency) locking mode.

Center Lap Belts

The center seating position for the Quad Cab® front seat has a lap belt only. To fasten the lap belt, slide the latch plate into the buckle until you hear a "click." To lengthen the lap belt, tilt the latch plate and pull. To remove slack, pull the loose end of the webbing. Wear the lap belt snug against the hips. Sit back and erect in the seat, then adjust the belt as tightly as is comfortable.

WARNING!

- **A lap belt worn too loose or too high is dangerous.**
- **A belt worn too loose can allow you to slip down and under the belt in a collision.**
- **A belt that is too loose or too high will apply crash forces to the abdomen, not to the stronger hip bones. In either case, the risk of internal injuries is greater. Wear a lap belt low and snug.**

Enhanced Driver Seat Belt Reminder System (BeltAlert®)

If the driver's seat belt has not been buckled within 60 seconds of starting the vehicle and if the vehicle speed is greater than 5 mph (8 km/h), the Enhanced Warning System (BeltAlert®) will alert the driver to buckle their seat belt. The driver should also instruct all other occupants to buckle their seat belts. If the driver unbuckles the seat belt while the vehicle is in motion an immediate chime will be heard and the Enhanced Warning System (BeltAlert®) will continue to chime and flash the Seat Belt Warning Light for 96 seconds or until the driver's seat belt is buckled. The Enhanced Warning System (BeltAlert®) will be reactivated if the ignition is cycled, the driver's seat belt is unbuckled for more than 10 seconds and the vehicle speed is greater than 5 mph (8 km/h).

The Enhanced Warning System (BeltAlert®) can be enabled or disabled by your authorized dealer or by following these steps:

NOTE: The following steps must occur within the first 60 seconds of the ignition switch being turned to the ON or START position. Freightliner LLC does not recommend deactivating the Enhanced Warning System (BeltAlert®).

1. With all doors closed and the ignition switch in any position except ON or START, buckle the driver's seat belt.

2. Turn the ignition switch to the ON position and wait for the Seat Belt Warning Light to turn off.

3. Within 60 seconds of starting the vehicle, unbuckle and then re-buckle the driver's seat belt at least three times within 10 seconds, ending with the seat belt buckled.

4. Turn off the engine. A single chime will sound to signify that you have successfully completed the programming.

The Enhanced Warning System (BeltAlert®) can be reactivated by repeating this procedure.

NOTE: Although the Enhanced Warning System (BeltAlert®) has been deactivated, the Seat Belt Warning Light will continue to illuminate while the driver's seat belt remains unbuckled.

Seat Belts and Pregnant Women

We recommend that pregnant women use seat belts throughout their pregnancies. Keeping the mother safe is the best way to keep the baby safe.

Pregnant women should wear the lap part of the belt across the thighs and as snug against the hips as possible. Keep the belt low so that it does not come across the abdomen. That way the strong bones of the hips will take the force if there is a collision.

Seat Belt Extender

If a seat belt is too short even when fully extended, your authorized dealer can provide you with a seat belt extender. This extender should be used only if the existing belt is not long enough. When it is not required, remove the extender and store it.

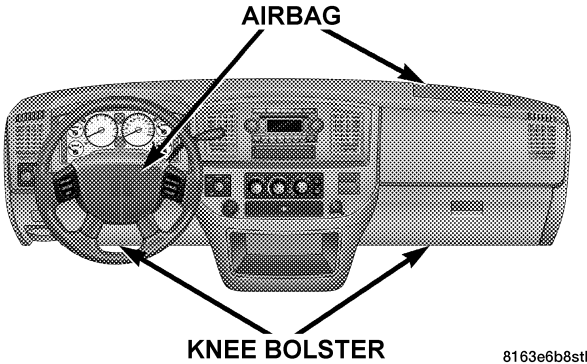
WARNING!

Using a seat belt extender when not needed can increase the risk of injury in a collision. Only use the seat belt extender when the lap belt is not long enough when it is worn low and snug, and in the recommended seating positions. Remove and store the extender when not needed.

Driver And Right Front Passenger Supplemental Restraint System (SRS) – Airbag

This vehicle may have front airbags for both the driver and front passenger (if equipped) as a supplement to the seat belt restraint systems. The driver's front airbag is mounted in the center of the steering wheel. The passenger's front airbag (if equipped) is mounted in the instrument panel, above the glove compartment. The words SRS AIRBAG are embossed on the airbag covers.

These airbags are certified to the new Federal regulations that allow less forceful deployments.



This vehicle may also be equipped **without** a passenger's front airbag. In this case the passenger's side airbag will be replaced with a storage bin.

WARNING!

- **Do not put anything on or around the airbag covers or attempt to manually open them. You may damage the airbags and you could be injured because the airbags are not there to protect you. These protective covers for the airbag cushions are designed to open only when the airbags are inflating.**
- **Do not mount any aftermarket equipment such as trailer brake controllers, snowplow controllers, auxiliary light switches, radios, etc. on or behind the knee bolster. Knee bolsters are designed to work with the airbag and seat belt to protect you. Mounting any additional equipment on or behind the knee bolster can cause injury during a crash.**

Airbags inflate in moderate to high speed impacts. Along with the seat belts, front airbags work with the instrument panel knee bolsters to provide improved protection for the driver and front passenger.

The seat belts are designed to protect you in many types of collisions. The front airbags deploy in moderate to severe frontal collisions. In certain types of collisions, the front airbags may be triggered. But even in collisions where the airbags work, you need the seat belts to keep you in the right position for the airbags to protect you properly.

Here are some simple steps you can follow to minimize the risk of harm from a deploying airbag.

- Children 12 years and under should ride buckled up in a rear seat, if available.
- Infants in rear-facing child restraints must **NEVER** ride in the front seat of a vehicle with a passenger front airbag **unless the airbag is turned off** (Regular Cab Vehicles Only). An airbag deployment can cause severe injury or death to infants in that position. Refer to the "Passenger Airbag On/Off Switch (if equipped)" in this section.
- If your vehicle does not have a rear seat, refer to the "Passenger Airbag On/Off Switch (if equipped)" in this section
- Children that are not big enough to properly wear the vehicle seat belt (refer to "Child Restraints" in this section) should be secured in the rear seat in child restraints or belt-positioning booster seats. Older children who do not use child restraints or belt-positioning booster seats should ride properly buckled up in the rear seat. Never allow children to slide the shoulder belt behind them or under their arms.
- All occupants should use their seat belts properly.

- The driver and front passenger seats should be moved back as far as practical to allow the airbag room to inflate.

WARNING!

- **Relying on the airbags alone could lead to more severe injuries in a collision. The airbags work with your seat belt to restrain you properly. In some collisions the airbags won't deploy at all. Always wear your seat belts even though you have airbags.**
- **Being too close to the steering wheel or instrument panel during airbag deployment could cause serious injury. Airbags need room to inflate. Sit back, comfortably extending your arms to reach the steering wheel or instrument panel.**

Airbag System Components

The airbag system consists of the following:

- Airbag Control Module
- AIRBAG Readiness Light
- Driver Airbag
- Passenger Airbag (if equipped)
- Steering Wheel and Column
- Instrument Panel
- Crash Sensor
- Interconnecting Wiring
- Knee Impact Bolsters
- Passenger's Side Front Airbag ON/OFF Switch (Regular Cab Vehicles Only) (if equipped)

How The Airbag System Works

- The airbag control module determines if a frontal collision is severe enough to require the airbags to inflate.
- The airbag control module will not detect rollover, or rear collisions.
- The airbag control module also monitors the readiness of the electronic parts of the system whenever the ignition switch is in the START or RUN positions. These include all of the items listed above except the knee bolsters, the instrument panel, and the steering wheel and column. If the key is in the OFF position, in the ACC position, or not in the ignition, the airbags are not on and will not inflate.
- The airbag control module also turns on the AIRBAG light in the instrument panel for 6 to 8 seconds when the ignition is first turned on, and then turns the light off.

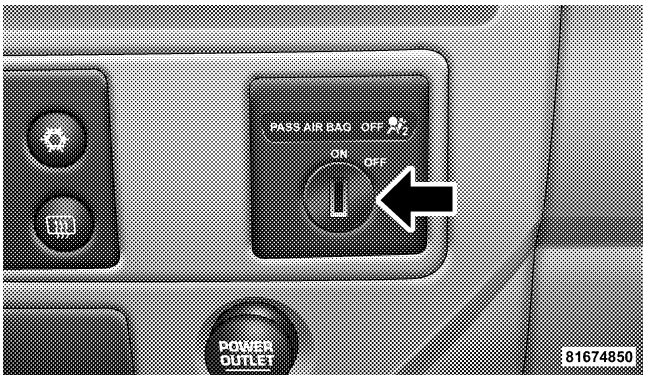
- If it detects a malfunction in any part of the system, it turns on the light either momentarily or continuously. The instrument cluster will flash the seat belt indicator if it detects a fault with the airbag indicator.

WARNING!

Ignoring the AIRBAG light in your instrument panel could mean you won't have the airbags to protect you in a collision. If the light does not come on, stays on after you start the vehicle, or if it comes on as you drive, have the airbag system checked right away.

- When the airbag control module detects a collision requiring the airbags, it signals the inflator units. A large quantity of nontoxic gas is generated to inflate the airbags. The airbag covers separate and fold out of the way as the airbags inflate to their full size. The airbags fully inflate in milliseconds. This is less time than it takes you to blink your eyes. The airbags then quickly deflate while helping to restrain the driver and front passenger (if equipped with passenger side airbag). The driver's front airbag deflates through vents toward the instrument panel. The passenger's front airbag (if equipped) is deflated through vent holes in the sides of the airbag. In this way the airbags do not interfere with your control of the vehicle.
- The knee impact bolsters help protect the knees and position you for the best interaction with the front airbag.

Passenger Airbag On/Off Switch (Regular Cab Vehicles Only) – If Equipped



Passenger Airbag On/Off Switch

The passenger front airbag is to be turned off only if the passenger:

- is an infant (less than one year old) who must ride in the front seat because there is no rear seat, because the

rear seat is too small for a rear-facing infant restraint or because the infant has a medical condition which makes it necessary for the driver to be able to see the infant,

- is a child, age one to 12 who must ride in the front seat because there is no rear seat, because there is no rear seat position available, or because the child has a medical condition which makes it necessary for the driver to be able to see the child,
- has a medical condition which makes passenger airbag (if equipped) inflation (deployment) a greater risk for the passenger than the risk of hitting the dashboard (instrument panel) or windshield in a crash.

WARNING!

Whenever an airbag is turned off, even a lap/shoulder belted passenger may hit their head, neck, or chest on the dashboard (instrument panel) or windshield in a crash. This may result in serious injury or death.

To Shut Off the Passenger Airbag (Regular Cab Vehicles Only) – If Equipped

Place the ignition key in the Passenger Airbag On/Off Switch (if equipped), push the key in and turn clockwise, and remove the key from the switch. This will shut off the passenger airbag (if equipped). The OFF light near the switch will illuminate when the ignition switch is turned to the ON position.

To Turn On the Passenger Airbag (Regular Cab Vehicles Only) – If Equipped

Place the ignition key in the Passenger Airbag On/Off Switch (If Equipped), push the key in and turn counterclockwise, and remove the key from the switch. This will turn on the passenger airbag (if equipped). The OFF light near the switch will be off when the ignition switch is turned to the ON position.

If A Deployment Occurs

The airbag system is designed to deploy when the airbag control module detects a moderate-to-severe frontal collision, and then immediately to deflate.

NOTE: A frontal collision that is not severe enough to need airbag protection will not activate the system. This does not mean something is wrong with the airbag system.

If you do have a collision which deploys the airbags, any or all of the following may occur:

- The nylon airbag material may sometimes cause abrasions and/or skin reddening to the driver and front passenger as the airbags deploy and unfold. The abrasions are similar to friction rope burns or those you might get sliding along a carpet or gymnasium floor. They are not caused by contact with chemicals. They are not permanent and normally heal quickly. However, if you haven't healed significantly within a few days, or if you have any blistering, see your doctor immediately.
- As the airbags deflate you may see some smoke-like particles. The particles are a normal by-product of the process that generates the nontoxic gas used for airbag inflation. These airborne particles may irritate the skin, eyes, nose, or throat. If you have skin or eye irritation, rinse the area with cool water. For nose or throat

irritation, move to fresh air. If the irritation continues, see your doctor. If these particles settle on your clothing, follow the garment manufacturer's instructions for cleaning.

- It is not advisable to drive your vehicle after the airbags have deployed. If you are involved in another collision, the airbags will not be in place to protect you.

WARNING!

Deployed airbags can't protect you in another collision. Have the airbags replaced by an authorized dealer as soon as possible.

Enhanced Accident Response System

If the airbags deploy after an impact and the electrical system remains functional, vehicles equipped with power door locks will unlock automatically. In addition, approximately 10 seconds after the vehicle has stopped moving, the interior lights will light until the ignition switch is turned off.

Maintaining Your Airbag Systems

WARNING!

- **Modifications to any part of the airbag system could cause it to fail when you need it. You could be injured because the airbags are not there to protect you. Do not modify the components or wiring, including adding any kind of badges or stickers to the steering wheel hub trim cover or the upper right side of the instrument panel. Do not modify the front bumper, vehicle body structure, or frame.**
- **You need proper knee impact protection in a collision. Do not mount or locate any aftermarket equipment on or behind the knee bolster.**
- **It is dangerous to try to repair any part of the airbag system yourself. Be sure to tell anyone who works on your vehicle that it has airbags.**

NOTE: Perchlorate Material – special handling may apply: Refer to www.dtsc.ca.gov/hazardouswaste/perchlorate.

Airbag Light

You will want to have the airbags ready to inflate for your protection in an impact. While the airbag system is designed to be maintenance free, if any of the following occurs, have an authorized dealer service the system promptly:

- The airbag light does not come on or flickers during the six to eight seconds when the ignition switch is first turned ON.
- The light remains on or flickers after the six to eight second interval.
- The light flickers or comes on and remains on while driving.

NOTE: If the speedometer, tachometer or any engine related gauges are not working, the airbag control module may also be disabled. The airbags may not be ready to inflate for your protection. Promptly check the fuse block for blown fuses. For proper location of airbag fuses, refer to "Fuses (Integrated Power Module)" in Section 7. See your authorized dealer if the fuse is good.

Event Data Recorder (EDR)

In the event of an accident, your vehicle is designed to record up to five seconds of specific vehicle data parameters (refer to the following list) in an event data recorder prior to the moment of airbag deployment and up to a quarter-second of high-speed deceleration data during and/or after airbag deployment. EDR data are ONLY recorded if an airbag deploys and are otherwise unavailable.

NOTE: Under certain circumstances, EDR data may not be recorded (e.g., loss of battery power).

In conjunction with other data gathered during a complete accident investigation, the electronic data may be used by Freightliner LLC and others to learn more about the possible causes of crashes and associated injuries in order to assess and improve vehicle performance. In addition to crash investigations initiated by Freightliner LLC, such investigations may be requested by customers, insurance carriers, government officials, and professional crash researchers, such as those associated with universities, and with hospital and insurance organizations.

In the event that an investigation is undertaken by Freightliner LLC (regardless of initiative), the company or its designated representative will first obtain permission of the appropriate custodial entity for the vehicle (usually the vehicle owner or lessee) before accessing the electronic data stored, unless ordered to download data by a court with legal jurisdiction (i.e., pursuant to a warrant). A copy of the data will be provided to the custodial entity upon request. General data that does not

identify particular vehicles or crashes may be released for incorporation in aggregate crash databases, such as those maintained by the US government and various states. Data of a potentially sensitive nature, such as would identify a particular driver, vehicle, or crash, will be treated confidentially. Confidential data will not be disclosed by Freightliner LLC to any third party except when:

1. Used for research purposes, such as to match data with a particular crash record in an aggregate database, provided confidentiality of personal data is thereafter preserved

2. Used in defense of litigation involving a Freightliner LLC product

3. Requested by police under a legal warrant

4. Otherwise required by law

Data parameters that may be recorded:

- Diagnostic trouble code(s) and warning lamp status for electronically-controlled safety systems, including the airbag system
- Airbag disable lamp status (if equipped)
- ″Time″ of airbag deployment (in terms of ignition cycles and vehicle mileage)
- Airbag deployment level (if applicable)
- Impact acceleration and angle
- Seat belt status
- Brake status (service and parking brakes)
- Accelerator status (including vehicle speed)
- Engine control status (including engine speed)

- Transmission gear selection
- Cruise control status
- Traction/stability control status
- Tire pressure monitoring system status (if equipped)

Child Restraint

Everyone in your vehicle needs to be buckled up all the time — babies and children, too. Every state in the United States and all Canadian provinces require that small children ride in proper restraint systems. This is the law, and you can be prosecuted for ignoring it.

Children 12 years and under should ride properly buckled up in a rear seat, if available. According to crash statistics, children are safer when properly restrained in the rear seats rather than in the front.

WARNING!

In a collision, an unrestrained child, even a tiny baby, can become a missile inside the vehicle. The force required to hold even an infant on your lap can become so great that you could not hold the child, no matter how strong you are. The child and others could be badly injured. Any child riding in your vehicle should be in a proper restraint for the child's size.

Infants and Small Children

There are different sizes and types of restraints for children from newborn size to the child almost large enough for an adult safety belt. Use the restraint that is correct for your child:

- Safety experts recommend that children ride rearward-facing in the vehicle until they are at least one year old and weigh at least 20 lbs (9 kg). Two types

of child restraints can be used rearward-facing: infant carriers and ″convertible″ child seats. Both types of child restraints are held in the vehicle by the lap/shoulder belt.

- The infant carrier is only used rearward-facing in the vehicle. It is recommended for children who weigh up to about 20 lbs (9 kg). ″Convertible″ child seats can be used either rearward-facing or forward-facing in the vehicle. Convertible child seats often have a higher weight limit in the rearward-facing direction than infant carriers do, so they can be used rearward-facing by children who weigh more than 20 lbs (9 kg) but are less than one year old.
- Rearward-facing child seats must **NEVER** be used in the front seat of a vehicle with a front passenger airbag (if equipped) unless the airbag is turned off. An airbag deployment could cause severe injury or death to infants in this position.
- Children who weigh more than 20 lbs (9 kg) and who are older than one year can ride forward-facing in the vehicle. Forward-facing child seats and convertible child seats used in the forward-facing direction are for children who weigh 20 to 40 lbs (9 to 18 kg) and who are older than one year. These child seats are also held in the vehicle by the lap/shoulder belt.
- The belt-positioning booster seat is for children weighing more than 40 lbs (18 kg), but who are still too small to fit the vehicle's seat belts properly. If the child cannot sit with knees bent over the vehicle's seat cushion while the child's back is against the seat back, they should use a belt-positioning booster seat. The child and booster seat are held in the vehicle by the lap/shoulder belt. (Some booster seats are equipped with a front shield and are held in the vehicle by the lap portion.) For further information, refer to www.seatcheck.org.

WARNING!

- **Improper installation can lead to failure of an infant or child restraint. It could come loose in a collision. The child could be badly injured or killed. Follow the manufacturer's directions exactly when installing an infant or child restraint.**
- **A rearward-facing child restraint should only be used in a rear seat, or in the front seat if the passenger's front airbag is Off (if equipped). If the airbag is left On, a rearward-facing child restraint in the front seat may be struck by a deploying passenger airbag (if equipped) which may cause severe or fatal injury to the infant.**

Here are some tips for getting the most out of your child restraint:

- Before buying any restraint system, make sure that it has a label certifying that it meets all applicable Safety Standards. We also recommend that you make sure that you can install the child restraint in the vehicle where you will use it before you buy it.
- The restraint must be appropriate for your child's weight and height. Check the label on the restraint for weight and height limits.
- Carefully follow the instructions that come with the restraint. If you install the restraint improperly, it may not work when you need it.

- The passenger seat belts are equipped with Automatic Locking Retractors (ALR), which are designed to keep the lap portion tight around the child restraint so that it is not necessary to use a locking clip.

  Pull the belt from the retractor until there is enough to allow you to pass through the child restraint and slide the latch plate into the buckle. Then pull on the belt until it is completely extended from the retractor. Allow the belt to return to the retractor, pulling on the excess webbing to tighten the lap portion about the child restraint. Refer to "Automatic Locking Retractors (ALR) Mode" in this section.

- In the rear seat, you may have trouble tightening the lap/shoulder belt on the child restraint because the buckle or latch plate is too close to the belt path opening on the restraint. Disconnect the latch plate from the buckle and twist the short buckle-end belt several times to shorten it. Insert the latch plate into the buckle with the release button facing out.

- If the belt still can't be tightened, or if pulling and pushing on the restraint loosens the belt, disconnect the latch plate from the buckle, turn the latch plate around, and insert the latch plate into the buckle again. If you still can't make the child restraint secure, try a different seating position.

- Buckle the child into the seat according to the child restraint manufacturer's directions.

- When your child restraint is not in use, secure it in the vehicle with the seat belt or remove it from the vehicle. Do not leave it loose in the vehicle. In a sudden stop or collision, it could strike the occupants or seat backs and cause serious personal injury.

WARNING!

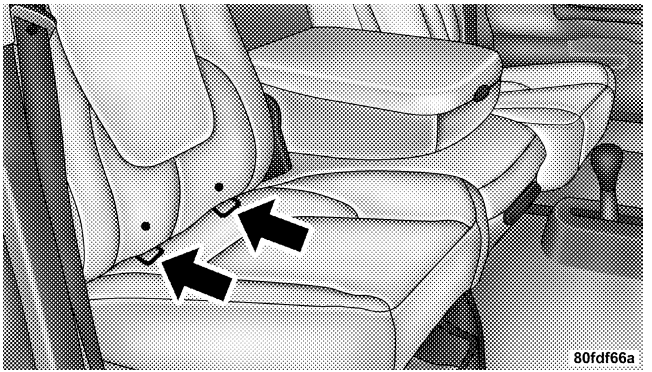
Improper installation can lead to failure of an infant or child restraint. It could come loose in a collision. The child could be badly injured or killed. Follow the manufacturer's directions exactly when installing an infant or child restraint.

Lower Anchors and Tether for CHildren (LATCH)

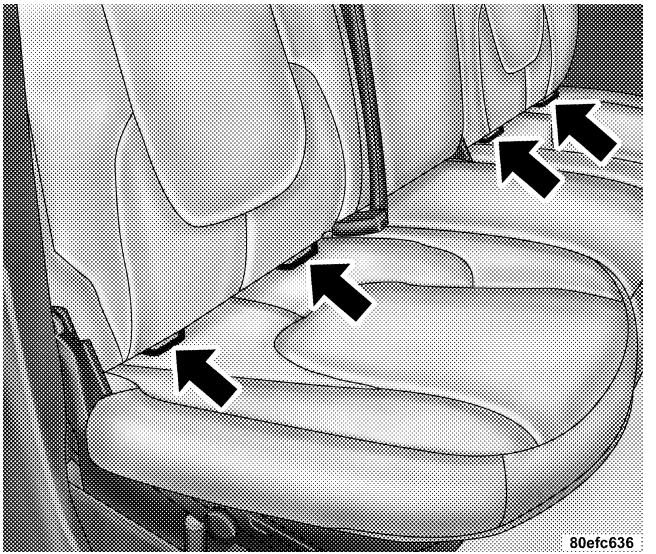
Each vehicle is equipped with the child restraint anchorage system called LATCH, which stands for Lower Anchors and Tether for CHildren. LATCH child restraint anchorage systems are installed in the Regular Cab passenger seat position and the Quad Cab® rear seat outboard positions. LATCH equipped seating positions feature both lower anchor bars, located at the back of the seat cushion, and tether strap anchorages, located behind the seat back (refer to "Child Restraint Tether Anchor" in this section).

Identification dots are located above the Regular Cab front seat lower anchorages as a guide for locating lower anchors.

NOTE: For children riding in the front seat of a Regular Cab model, refer to the "Passenger Airbag On/Off Switch (if equipped)" in this section.



Regular Cab Passenger Seat



Quad Cab® Rear Outboard Seats

Child restraint systems having attachments designed to connect to the lower anchorages are now available. Child restraints having tether straps and hooks for connection to the seat back tether anchorage have been available for some time. In fact, many child restraint manufacturers will provide add-on tether strap kits for some of their older products.

Because the lower anchorages are to be introduced to passenger carrying vehicles over a period of years, child restraint systems having attachments for those anchorages will continue to have features for installation in vehicles using the lap or lap/shoulder belt. They will also have tether straps, and you are urged to take advantage of all of the available attachments provided with your child restraint in any vehicle.

NOTE: When using the LATCH attaching system to install a child restraint, please ensure that all seat belts not being used for occupant restraints are stowed and out of reach of children. It is recommended that before installing the child restraint, buckle the seat belt so the seat belt is tucked behind the child restraint and out of reach. If the buckled seat belt interferes with the child restraint installation, instead of tucking the seat belt behind the child restraint, route the seat belt through the child restraint belt path and then buckle it. This should stow the seat belt out of the reach of an inquisitive child. Remind all children in the vehicle that the seat belts are not toys and should not be played with, and never leave your child unattended in the vehicle.

NOTE: If your child restraint seat is not LATCH compatible, install the restraint using the vehicle seat belting.

Installing the Child Restraint System

WARNING!

Do not install child restraint systems equipped with LATCH attachments in the center position of a Quad Cab® model rear seat. The LATCH anchorages in this seat are designed for the two outboard seating positions only. A child may be placed in the rear center seating position of a Quad Cab® model using the seat belt and child tether anchorage. Failure to follow this may result in serious or fatal injury.

We urge that you carefully follow the directions of the manufacturer when installing your child restraint. Many, but not all, restraint systems will be equipped with separate straps on each side, with each having a hook or connector and a means for adjusting the tension in the strap. Forward-facing toddler restraints and some rearward-facing infant restraints will also be equipped with a tether strap, a hook and means for adjusting the tension in the strap.

In general, you will first loosen the adjusters on the lower straps and tether straps so that you can more easily attach the hook or connector to the lower anchorages and tether anchorages. Then tighten all three straps as you push the child restraint rearward and downward into the seat.

Not all child restraint systems will be installed as we have described here. Again, carefully follow the instructions that come with the child restraint system.

WARNING!

Improper installation of a child restraint to the LATCH anchorages can lead to failure of an infant or child restraint. The child could be badly injured or killed. Follow the manufacturer's directions exactly when installing an infant or child restraint.

Child Restraint Tether Anchor

Child restraints having tether straps and hooks for connection to tether anchors have been available for some time. In fact, many child restraint manufacturers will provide add-on tether strap kits for their older products. Regular Cab models have two tether anchorages, one each behind the front center and right seats. Quad Cab® models have three anchorages, one behind each of the rear seats.

WARNING!

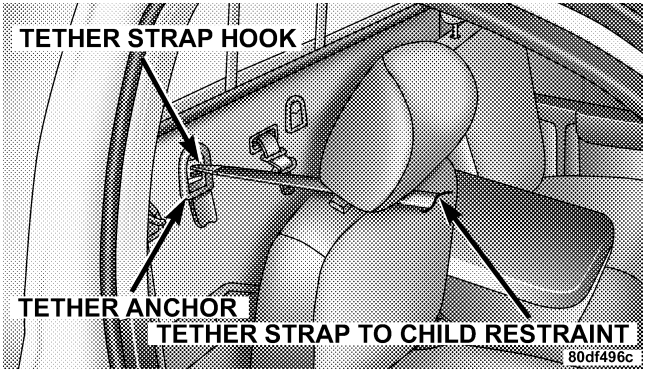
An incorrectly anchored tether strap could lead to seat failure and injury to the child. In a collision, the seat could come loose and allow the child to crash into the inside of the vehicle or other passengers, or even be thrown from the vehicle. Use only the anchor positions directly behind the child seat to secure a child restraint top tether strap. Follow the instructions below. See your authorized dealer for help if necessary.

Tether Anchorage Points at the Right and Center Front Seat (Regular Cab - All Seats)

1. Place the child restraint on the seat and adjust the tether strap so that it will reach over the seat back under the head restraint to the tether anchor directly behind the seat.

2. Lift the cover (if so equipped), and attach the hook to the square opening in the sheet metal.

3. Install the child restraint and remove the slack in the tether strap according to the manufacturer's instructions.



Regular Cab Tether Strap Mounting

Multiple Child Restraint Installation Sequence (Quad Cab® - Rear Seats)

1. Obtain tether straps by raising the head restraints and reaching between the rear glass and rear seat. The tether strap may be retained with an elastic band. Accessibility to the tether strap is greatly improved by raising the seat cushion to the "up" position. Remove the elastic before use.

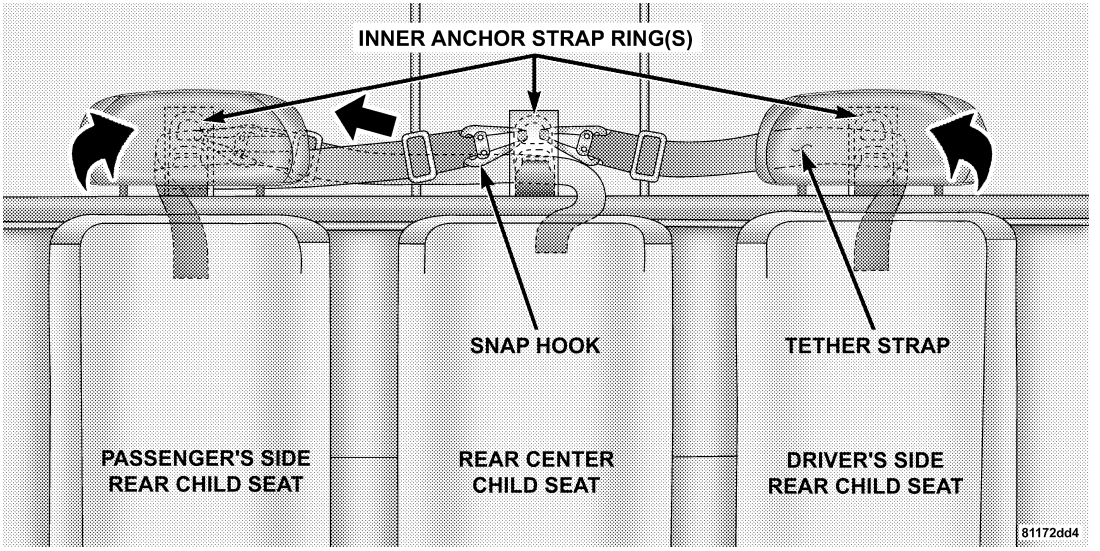
2. Place a child restraint on each outboard rear seat and adjust the tether strap so that it will reach under the head restraint to the tether anchor directly behind the seat and then to the anchor directly behind the center rear seat.

3. Pass each tether strap hook under the head restraint and through the loop of webbing behind the child seat.

4. Route each tether strap to the anchor behind the center seat, and attach the hooks to the metal ring.

5. Place a child restraint on the center rear seat and adjust the tether strap so that it will reach under the head restraint to the tether anchor directly behind the seat and to the anchor directly behind the right seat.

6. Install each child restraint and remove the slack in the tether strap according to the child restraint manufacturer's instructions.



Multiple Child Restraint Quad Cab®

Children Too Large for Booster Seats
Children who are large enough to wear the shoulder belt comfortably, and whose legs are long enough to bend over the front of the seat when their back is against the seat back should use the lap/shoulder belt in a rear seat.

- Make sure that the child is upright in the seat.
- The lap portion should be low on the hips and as snug as possible.
- Check belt fit periodically. A child's squirming or slouching can move the belt out of position.

If the shoulder belt contacts the face or neck, move the child closer to the center of the vehicle. Never allow a child to put the shoulder belt under an arm or behind their back.

Transporting Pets
Airbags deploying in the front seat could harm your pet. An unrestrained pet will be thrown about and possibly injured, or injure a passenger during panic braking or in a collision. Pets should be restrained in the rear seat in pet harnesses or pet carriers that are secured by seat belts.

NEW ENGINE BREAK-IN

6.7L Diesel Engine
Your Cummins® 24-Valve Turbo Diesel engine does not require a break-in period due to its construction. Normal operation is allowed, provided the following recommendations are followed:

NOTE: Light duty operation such as light trailer towing or no load operation, will extend the time before the engine is at full efficiency and may affect the performance of the vehicle aftertreatment (exhaust) system. Reduced fuel economy and power may be seen at this time.

- Warm up the engine before placing it under load.

- Do not operate the engine at idle for prolonged periods.
- Use the appropriate transmission gear to prevent engine lugging.
- Observe vehicle oil pressure and temperature indicators.
- Check the coolant and oil levels frequently.
- Vary throttle position at highway speeds when carrying or towing significant weight.

Because of the construction of the Cummins Diesel engine, engine run-in is enhanced by loaded operating conditions which allow the engine parts to achieve final finish and fit during the first 6,000 mi (10 000 km).

CAUTION!

- **During the first 500 mi (805 km) your new vehicle is driven, do not tow a trailer. Doing so may damage your axles, drivetrain and vehicle.**
- **Limit your speed to 50 mph (80 km/h) during the first 500 mi (805 km) of towing.**

SAFETY TIPS

Transporting Passengers

This vehicle is designed to carry passengers in the cab only. For safety reasons, NEVER TRANSPORT PASSENGERS IN THE CARGO AREA.

WARNING!

It is extremely dangerous to ride in a cargo area, inside or outside of a vehicle. In a collision, people riding in these areas are more likely to be seriously injured or killed.

Do not allow people to ride in any area of your vehicle that is not equipped with seats and seat belts.

Be sure everyone in your vehicle is in a seat and using a seat belt properly.

Lock Your Vehicle

Always remove the key from the ignition and lock all doors when leaving the vehicle unattended, even in your own driveway or garage. Try to park your vehicle in a well-lighted area and never invite theft by leaving articles of value exposed.

Exhaust Gas

WARNING!

Exhaust gases contain carbon monoxide, a potentially toxic gas that, by itself, is colorless and odorless. To avoid inhaling these gases, the following precautions should be observed:

- Do not run the engine in a closed garage or in confined areas any longer than needed to move your vehicle in or out of the area.
- If it is necessary to sit in a parked vehicle with the engine running for more than a short period, adjust your climate control system to force outside air into the vehicle. Set the blower at high speed and the controls in any position except OFF or MAX A/C.

- The best protection against carbon monoxide entry into the vehicle body is a properly maintained engine exhaust system.

Be aware of changes in the sound of the exhaust system, exhaust fumes detected inside the vehicle, or damage to the underside or rear of the vehicle. Have a competent authorized mechanic inspect the complete exhaust system and adjacent body areas for broken, damaged, deteriorated or mispositioned parts. Open seams or loose connections could permit exhaust fumes to seep into the passenger compartment. In addition, inspect the exhaust system each time the vehicle is raised for lubrication or oil change. Replace or adjust as required.

Safety Checks You Should Make Inside The Vehicle

Heater Defroster Ducts

Inspect the heater defroster ducts for proper operation. Check for proper airflow through all defroster ducts. If there are any questions regarding the operation of your heater defroster ducts, have the system checked by an authorized dealer.

Seat Belts

Inspect the belt system periodically, checking for cuts, frays and loose parts. Damaged parts must be replaced immediately. Do not disassemble or modify the system.

Seat belt assemblies must be replaced after an accident if they have been damaged (bent retractor, torn webbing, etc.) or if the front airbags have deployed. If there is any question regarding belt or retractor condition, replace the belt.

Airbag Light
The light should come on and remain on for six to eight seconds as a bulb check when the ignition switch is first turned ON. If the light is not lit during starting, see your authorized dealer. If the light stays on, flickers or comes on while driving, have the system checked by an authorized dealer. If there is a problem with the airbag light, the seat belt light will flash.

Safety Checks You Should Make Outside The Vehicle

Tires
Examine tires for tread wear or uneven wear patterns. Check for stones, nails, glass or other objects lodged in the tread.

Inspect for tread cuts or sidewall cracks. Check wheel nuts for tightness and tires for proper pressure.

Lights
Check the operation of all exterior lights. Check turn signal and high beam indicator lights on the instrument panel.

Door Latches
Check for positive closing, latching and locking.

Fluid Leaks
Check area under the vehicle after overnight parking for fuel, water, oil, or other fluid leaks. Also, if fuel fumes are detected, the cause should be located and corrected.

UNDERSTANDING THE FEATURES OF YOUR VEHICLE

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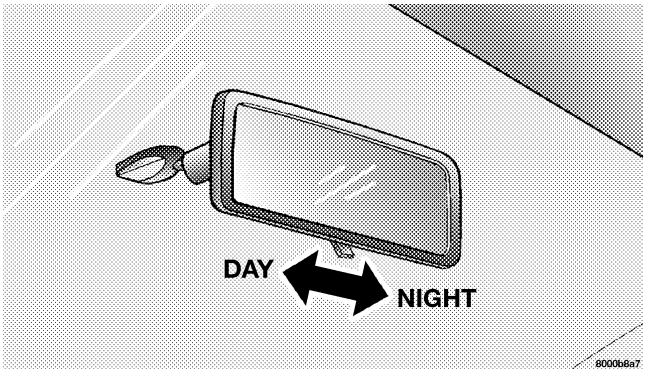
MIRRORS

Inside Mirror

The mirror should be adjusted to center on the view through the rear window.

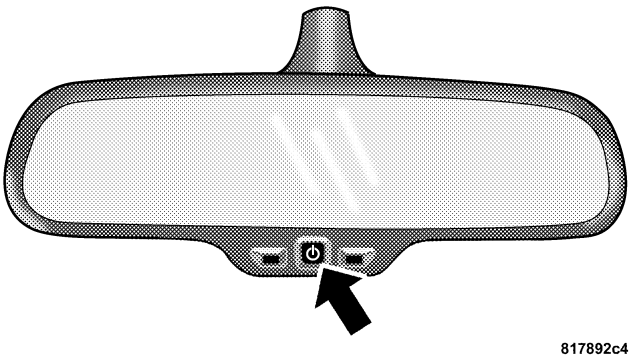
Annoying headlight glare can be reduced by moving the small control under the mirror to the night position (toward rear of vehicle). The mirror should be adjusted while set in the day position (toward windshield).



Adjusting Rearview Mirror

Automatic Dimming Mirror – If Equipped

This mirror automatically adjusts for annoying headlight glare from vehicles behind you. You can turn the feature on or off by pressing the button at the base of the mirror. A light in the button will indicate when the dimming feature is activated.



Automatic Dimming Mirror

CAUTION!

To avoid damage to the mirror during cleaning, never spray any cleaning solution directly onto the mirror. Apply the solution onto a clean cloth and wipe the mirror clean.

Outside Mirrors

To receive maximum benefit, adjust the outside mirror(s) to center on the adjacent lane of traffic with a slight overlap of the view obtained on the inside mirror.

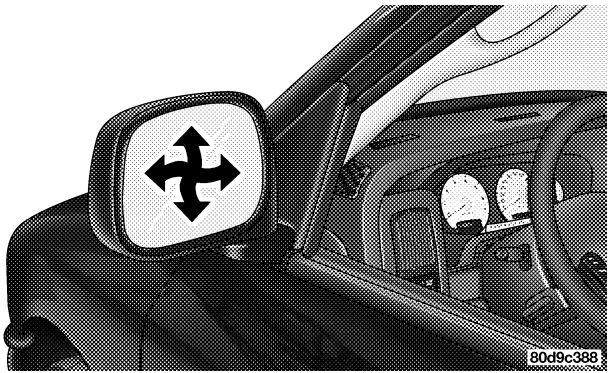
WARNING!

Vehicles and other objects seen in a right side convex mirror will look smaller and farther away than they really are. Relying too much on your right side convex mirror could cause you to collide with another vehicle or other object. Use your inside mirror when judging the size or distance of a vehicle seen in the right side convex mirror. Some vehicles will not have a convex right side mirror.

Exterior Mirrors Folding Feature

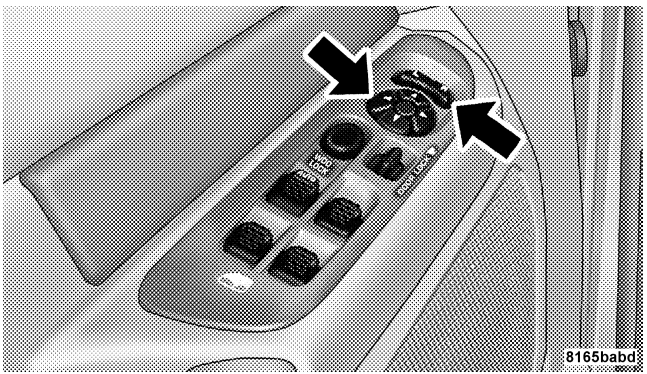
All 6 x 9 inch exterior mirrors are hinged and may be moved either forward or rearward to resist damage. The hinges have three detent positions; full forward, full rearward, and normal.

Electronic Power Mirrors – If Equipped



Power Mirror Movement

The controls for the power mirrors are located on the driver's door trim panel.



Power Mirror Switches

Set the top switch to the left or right for the left or right mirror, and set it to the center off position to prevent accidentally moving a mirror when you are finished adjusting the mirror. To adjust a mirror, select left or right with the top switch, and press one of the four arrows for the direction you want the mirror to move.

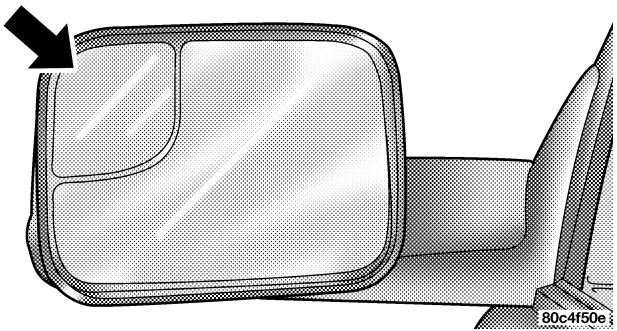
Electric Rear Window Defroster and Heated Sideview Mirrors – If Equipped

The Electric Rear Window Defroster and Heated Sideview Mirrors are activated by pressing the heated grid button, located on the Climate Control panel, with the ignition ON. Turning Off the rear window defroster or the ignition will deactivate the Electric Rear Window Defroster and Heated Sideview Mirrors feature. These features turn off automatically after 15 minutes have elapsed for the first activation per ignition cycle. Each subsequent activation of these features per ignition cycle will shut off automatically after 10 minutes have elapsed. To reactivate, simply press the button again.

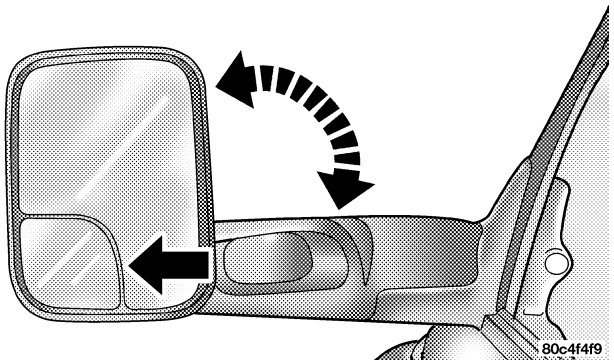
Trailer Towing Mirrors – If Equipped

These mirrors are designed with an adjustable mirror head to provide a greater vision range when towing extra-wide loads. To change position inboard or outboard, the mirror head should be rotated (flipped out or in). A small blind-spot mirror is integrated onto the main mirror surface.

NOTE: Fold the trailer towing mirrors rearward prior to entering an automated car wash.



Blindspot Mirror



Trailer Towing Position

HANDS-FREE COMMUNICATION (UConnect®) — IF EQUIPPED

UConnect® is a voice-activated, hands-free, in-vehicle communications system. UConnect® allows you to dial a phone number with your cellular phone using simple voice commands (e.g., ″Call″ ... ″Mike″ ...″Work″ or ″Dial″ ... ″248-555-1212″). Your cellular phone's audio is transmitted through your vehicle's audio system; the system will automatically mute your radio when using the UConnect® system.

NOTE: The UConnect® system requires a cellular phone equipped with the Bluetooth® ″Hands-Free Profile,″ Version 0.96 or higher. See the UConnect® website for supported phones.

NOTE: For UConnect® customer support, contact your authorized Sterling dealer.

UConnect® allows you to transfer calls between the system and your cellular phone as you enter or exit your vehicle and enables you to mute the system's microphone for private conversation.

The UConnect® phonebook enables you to store up to 32 names, with four numbers per name. Each language has a separate 32-name phonebook accessible only in that language. This system is driven through your Bluetooth® "Hands-Free profile" cellular phone. UConnect® features Bluetooth® technology - the global standard that enables different electronic devices to connect to each other without wires or a docking station, so UConnect® works no matter where you stow your cellular phone (be it your purse, pocket, or briefcase), as long as your phone is turned on and has been paired to the vehicle's UConnect® system. The UConnect® system allows up to seven cellular phones to be linked to the system. Only

one linked (or paired) cellular phone can be used with the system at a time. The system is available in English, Spanish, or French languages.

Phone Button

The rearview mirror contains the microphone for the system (depending on the type of mirror and radio equipped), and either the radio or the mirror has the two control buttons (PHONE Button and VOICE RECOGNITION button) that will enable you to access the system.

Voice Recognition Button

Actual button location may vary with radio. The individual buttons are described in the "Operation" section.

The UConnect® system can be used with any Hands-Free Profile certified Bluetooth® cellular phone. See the UConnect® website for supported phones. If your cellular phone supports a different profile (e.g., Headset Profile) you may not be able to use any UConnect® features. Refer to your cellular service provider or the phone manufacturer for details.

The UConnect® system is fully integrated with the vehicle's audio system. The volume of the UConnect® system can be adjusted either from the radio volume control knob or from the steering wheel radio control (right switch), if so equipped.

The radio display will be used for visual prompts from the UConnect® system such as ″CELL″ or caller ID on certain radios.

3

Operation

Voice commands can be used to operate the UConnect® system and to navigate through the UConnect® menu structure. Voice commands are required after most UConnect® system prompts. You will be prompted for a specific command and then guided through the available options.

- Prior to giving a voice command, one must wait for the beep, which follows the "Ready" prompt or another prompt.
- For certain operations, compound commands can be used. For example, instead of saying "Setup" and then "Phone Pairing," the following compound command can be said: "Setup Phone Pairing."
- For each feature explanation in this section, only the combined form of the voice command is given. You can also break the commands into parts and say each part of the command when you are asked for it. For example, you can use the combined form voice command "Phonebook New Entry," or you can break the combined form command into two voice commands: "Phonebook" and "New Entry." Please remember, the UConnect® system works best when you talk in a normal conversational tone, as if speaking to someone sitting a few feet/meters away from you.

Voice Command Tree

Refer to "Voice Tree" in this section.

Help Command

If you need assistance at any prompt, or if you want to know your options at any prompt, say "Help" following the beep. The UConnect® system will play all the options at any prompt if you ask for help.

To activate the UConnect® system from idle, simply press the PHONE button and follow the audible prompts for directions. All UConnect® system sessions begin with a press of the PHONE button on the radio control head.

Cancel Command
At any prompt, after the beep, you can say "Cancel" and you will be returned to the main menu. However, in a few instances the system will take you back to the previous menu.

Pair (Link) UConnect® System to a Cellular Phone
To begin using your UConnect® system, you must pair your compatible Bluetooth® enabled cellular phone.

To complete the pairing process, you will need to reference your cellular phone Owner's Manual. The UConnect® website may also provide detailed instructions for pairing.

The following are general phone to UConnect® system pairing instructions:

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Setup Phone Pairing."
- When prompted, after the beep, say "Pair a Phone" and follow the audible prompts.
- You will be asked to say a four-digit Personal Identification Number (PIN), which you will later need to enter into your cellular phone. You can enter any four-digit PIN. You will not need to remember this PIN after the initial pairing process.
- For identification purposes, you will be prompted to give the UConnect® system a name for your cellular phone. Each cellular phone that is paired should be given a unique phone name.
- You will then be asked to give your cellular phone a priority level between 1 and 7, with 1 being the highest priority. You can pair up to seven cellular phones to your UConnect® system. However, at any given time, only one cellular phone can be in use, connected to your UConnect® system. The priority allows the UConnect® system to know which cellular phone to

use if multiple cellular phones are in the vehicle at the same time. For example, if priority 3 and priority 5 phones are present in the vehicle, the UConnect® system will use the priority 3 cellular phone when you make a call. You can select to use a lower priority cellular phone at any time (refer to ″Advanced Phone Connectivity″ in this section).

Dial by Saying a Number

- Press the PHONE button to begin.
- After the ″Ready″ prompt and the following beep, say ″Dial.″
- The system will prompt you to say the number you want to call.
- For example, you can say ″234-567-8901.″ The phone number that you enter must be of valid length and combination. Based on the country in which the vehicle was purchased, the UConnect® system limits the user from dialing an invalid combination of numbers. For example, in the U.S., 234-567-890 is nine digits long, which is not a valid U.S. phone number - the closest valid phone number has 10 digits.
- The UConnect® system will confirm the phone number and then dial. The number will appear in the display of certain radios.

Call by Saying a Name

- Press the PHONE button to begin.
- After the ″Ready″ prompt and the following beep, say ″Call.″
- The system will prompt you to say the name of the person you want to call.
- After the ″Ready″ prompt and the following beep, say the name of the person you want to call. For example, you can say ″John Doe,″ where John Doe is a previously stored name entry in the UConnect® phonebook.

To learn how to store a name in the phonebook, refer to "Add Names to Your UConnect® Phonebook," in this section.

- The UConnect® system will confirm the name and then dial the corresponding phone number, which may appear in the display of certain radios.

Add Names to Your UConnect® Phonebook

NOTE: Adding names to the phonebook is recommended when the vehicle is not in motion.

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Phonebook New Entry."
- When prompted, say the name of the new entry. Use of long names helps the voice recognition and it is recommended. For example, say "Robert Smith" or "Robert" instead of "Bob."
- When prompted, enter the number designation (e.g., "Home," "Work," "Mobile," or "Pager"). This will allow you to store multiple numbers for each phonebook entry, if desired.
- When prompted, recite the phone number for the phonebook entry that you are adding.

After you are finished adding an entry into the phonebook, you will be given the opportunity to add more phone numbers to the current entry or to return to the main menu.

The UConnect® system will allow you to enter up to 32 names in the phonebook with each name having up to four associated phone numbers and designations. Each language has a separate 32-name phonebook accessible only in that language.

Phonebook Download

UConnect® allows the user to download entries from their phone via Bluetooth®. To use this feature, press the PHONE button and say "Phonebook Download." The system prompts, "Ready to accept "V" card entry via Bluetooth®…" The system is now ready to accept phonebook entries from your phone using the Bluetooth® Object Exchange Profile (OBEX). Please see your phone Owner's Manual for specific instructions on how to send these entries from your phone.

NOTE:

- The phone handset must support Bluetooth® OBEX transfers of phonebook entries to use this feature.
- Some phones cannot send phonebook entries if they are already connected to any system via Bluetooth®, and you may see a message on the phone display that the Bluetooth® link is busy. In this case, the user must first disconnect or drop the Bluetooth® connection to the UConnect® system, and then send the address book entry via Bluetooth®. Please see your phone Owner's Manual for specific instructions on how to drop the Bluetooth® connection.
- If the phonebook entry is longer than 24 characters, it will only use the first 24 characters.

Edit Entries in the UConnect® Phonebook

NOTE: Editing names in the phonebook is recommended when the vehicle is not in motion.

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Phonebook Edit."
- You will then be asked for the name of the phonebook entry that you wish to edit.
- Next, choose the number designation (home, work, mobile, or pager) that you wish to edit.

- When prompted, recite the new phone number for the phonebook entry that you are editing.

After you are finished editing an entry in the phonebook, you will be given the opportunity to edit another entry in the phonebook, call the number you just edited, or return to the main menu.

"Phonebook Edit" can be used to add another phone number to a name entry that already exists in the phonebook. For example, the entry John Doe may have a mobile and a home number, but you can add "John Doe's" work number later using the "Phonebook Edit" feature.

Delete Entries in the UConnect® Phonebook

NOTE: Editing phonebook entries is recommended when the vehicle is not in motion.

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Phonebook Delete."
- After you enter the Phonebook Delete menu, you will then be asked for the name of the entry that you wish to delete. You can either say the name of a phonebook entry that you wish to delete or you can say "List Names" to hear a list of the entries in the phonebook from which you choose. To select one of the entries from the list, press the "Voice Recognition" button while the UConnect® system is playing the desired entry and say "Delete."
- After you enter the name, the UConnect® system will ask you which designation you wish to delete: home, work, mobile, pager, or all. Say the designation you wish to delete.
- Note that only the phonebook entry in the current language is deleted.

Delete All Entries in the UConnect® Phonebook

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Phonebook Erase All."
- The UConnect® system will ask you to verify that you wish to delete all the entries from the phonebook.
- After confirmation, the phonebook entries will be deleted.
- Note that only the phonebook in the current language is deleted.

List All Names in the UConnect® Phonebook

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Phonebook List Names."
- The UConnect® system will play the names of all the phonebook entries.
- To call one of the names in the list, press the "Voice Recognition" button during the playing of the desired name, and say "Call."

NOTE: The user can also exercise "Edit" or "Delete" operations at this point.

- The UConnect® system will then prompt you as to the number designation you wish to call.
- The selected number will be dialed.

Phone Call Features

The following features can be accessed through the UConnect® system if the feature(s) are available on your cellular service plan. For example, if your cellular service plan provides three-way calling, this feature can be

accessed through the UConnect® system. Check with your cellular service provider for the features that you have.

Answer or Reject an Incoming Call - No Call Currently in Progress

When you receive a call on your cellular phone, the UConnect® system will interrupt the vehicle audio system, if on, and will ask if you would like to answer the call. Press the PHONE button to accept the call. To reject the call, press and hold the PHONE button until you hear a single beep, indicating that the incoming call was rejected.

Answer or Reject an Incoming Call - Call Currently in Progress

If a call is currently in progress and you have another incoming call, you will hear the same network tones for call waiting that you normally hear when using your cell phone. Press the PHONE button to place the current call on hold and answer the incoming call.

NOTE: The UConnect® system compatible phones in the market today do not support rejecting an incoming call when another call is in progress. Therefore, the user can only answer an incoming call or ignore it.

Making a Second Call While Current Call in Progress

To make a second call while you are currently on a call, press the "Voice Recognition" button and say "Dial" or "Call" followed by the phone number or phonebook entry you wish to call. The first call will be on hold while the second call is in progress. To go back to the first call, refer to "Toggling Between Calls" in this section. To combine two calls, refer to "Conference Call" in this section.

Place/Retrieve a Call From Hold
To put a call on hold, press the PHONE button until you hear a single beep. This indicates that the call is on hold. To bring the call back from hold, press and hold the PHONE button until you hear a single beep.

Toggling Between Calls
If two calls are in progress (one active and one on hold), press the PHONE button until you hear a single beep, indicating that the active and hold status of the two calls have switched. Only one call can be placed on hold at one time.

Conference Call
When two calls are in progress (one active and one on hold), press and hold the PHONE button until you hear a double beep indicating that the two calls have been joined into one conference call.

Three-Way Calling
To initiate three-way calling, press the "Voice Recognition" button while a call is in progress, and make a second phone call, as described under "Making a Second Call While Current Call in Progress." After the second call has established, press and hold the PHONE button until you hear a double beep, indicating that the two calls have been joined into one conference call.

Call Termination
To end a call in progress, momentarily press the PHONE button. Only the active call(s) will be terminated and if there is a call on hold, it will become the new active call. If the active call is terminated by the far end, a call on hold may not become active automatically. This is cell phone-dependent. To bring the call back from hold, press and hold the PHONE button until you hear a single beep.

Redial

- Press the PHONE button to begin.
- After the ″Ready″ prompt and the following beep, say ″Redial.″
- The UConnect® system will call the last number that was dialed from your cellular phone.

NOTE: This may not be the last number dialed from the UConnect® system.

Call Continuation

Call continuation is the progression of a phone call on the UConnect® system after the vehicle ignition key has been switched to OFF. Call continuation functionality available on the vehicle can be any one of three types:

- After the ignition key is switched to OFF, a call can continue on the UConnect® system either until the call ends, or until the vehicle battery condition dictates cessation of the call on the UConnect® system and transfer of the call to the mobile phone.
- After the ignition key is switched to OFF, a call can continue on the UConnect® system for a certain duration, after which the call is automatically transferred from the UConnect® system to the mobile phone.
- An active call is automatically transferred to the mobile phone after the ignition key is switched to OFF.

UConnect® System Features

Language Selection

To change the language that the UConnect® system is using:

- Press the PHONE button to begin.

- After the "Ready" prompt and the following beep, say the name of the language you wish to switch to English, Espanol, or Francais.
- Continue to follow the system prompts to complete language selection.

After selecting one of the languages, all prompts and voice commands will be in that language.

NOTE: After every UConnect® language change operation, only the language-specific 32-name phonebook is usable. The paired phone name is not language-specific and usable across all languages.

Emergency Assistance

If you are in an emergency and the mobile phone is reachable:

- Pick up the phone and manually dial the emergency number for your area.

If the phone is not reachable and the UConnect® system is operational, you may reach the emergency number as follows:

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Emergency" and the UConnect® system will instruct the paired cellular phone to call the emergency number. This feature is supported in the U.S., Canada, and Mexico.

NOTE: The emergency number dialed is based on the country where the vehicle is purchased (911 for the U.S. and Canada). The number dialed may not be applicable with the available cellular service and area.

The UConnect® system does slightly lower your chances of successfully making a phone call as to that for the cell phone directly.

Your phone must be turned on and paired to the UConnect® system to allow use of this vehicle feature in emergency situations, when the cell phone has network coverage and stays paired to the UConnect® system.

Towing Assistance
For towing assistance, call the Customer Assistance Center, 1–800–785–4357. Do not use the towing assistance feature within the UConnect® system.

Paging
To learn how to page, refer to "Working with Automated Systems." Paging works properly except for pagers of certain companies, which time out a little too soon to work properly with the UConnect® system.

Voice Mail Calling
To learn how to access your voice mail, refer to "Working with Automated Systems."

Working with Automated Systems
This method is used in instances where one generally has to press numbers on the cellular phone keypad while navigating through an automated telephone system.

You can use your UConnect® system to access a voice mail system or an automated service, such as a paging service or automated customer service line. Some services require immediate response selection. In some instances, that may be too quick for use of the UConnect® system.

When calling a number with your UConnect® system that normally requires you to enter in a touch-tone sequence on your cellular phone keypad, you can press the "Voice Recognition" button and say the sequence you wish to enter, followed by the word "Send." For example, if required to enter your PIN followed with a pound, (3 7 4 6 #), you can press the "Voice Recognition" button and say, "3 7 4 6 # Send." Saying a number, or sequence of

numbers, followed by "Send," is also to be used for navigating through an automated customer service center menu structure, and to leave a number on a pager.

You can also send stored UConnect® phonebook entries as tones for fast and easy access to voice mail and pager entries. To use this feature, dial the number you wish to call and then press the "Voice Recognition" button and say, "Send." The system will prompt you to enter the name or number and say the name of the phonebook entry you wish to send. The UConnect® system will then send the corresponding phone number associated with the phonebook entry, as tones over the phone.

NOTE:

- You may not hear all of the tones due to cellular phone network configurations; this is normal.
- Some paging and voice mail systems have system time out settings that are too short and may not allow the use of this feature.

Barge In - Overriding Prompts

The "Voice Recognition" button can be used when you wish to skip part of a prompt and issue your voice recognition command immediately. For example, if a prompt is asking "Would you like to pair a phone, clear a...," you could press the "Voice Recognition" button and say, "Pair a Phone" to select that option without having to listen to the rest of the voice prompt.

Turning Confirmation Prompts On/Off

Turning confirmation prompts off will stop the system from confirming your choices (e.g., the UConnect® system will not repeat a phone number before you dial it).

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Setup Confirmations." The UConnect® system will play the current confirmation prompt status and you will be given the choice to change it.

Phone and Network Status Indicators
If available on the radio and/or on a premium display such as the instrument panel cluster, and supported by your cell phone, the UConnect® system will provide notification to inform you of your phone and network status when you are attempting to make a phone call using UConnect®. The status is given for roaming, network signal strength, phone battery strength, etc.

Dialing Using the Cellular Phone Keypad
You can dial a phone number with your cellular phone keypad and still use the UConnect® system (while dialing via the cell phone keypad, the user must exercise caution and take precautionary safety measures). By dialing a number with your paired Bluetooth® cellular phone, the audio will be played through your vehicle's audio system. The UConnect® system will work the same as if you dial the number using voice recognition.

NOTE: Certain brands of mobile phones do not send the dial ring to the UConnect® system to play it on the vehicle audio system, so you will not hear it. Under this situation, after successfully dialing a number the user may feel that the call did not go through even though the call is in progress. Once your call is answered, you will hear the audio.

Mute/Un-Mute (Mute Off)
When you mute the UConnect® system, you will still be able to hear the conversation coming from the other party, but the other party will not be able to hear you. In order to mute the UConnect® system:

- Press the "Voice Recognition" button.
- Following the beep, say "Mute."

In order to un-mute the UConnect® system:

- Press the "Voice Recognition" button.
- Following the beep, say "Mute off."

Advanced Phone Connectivity

Transfer Call to and from Cellular Phone

The UConnect® system allows ongoing calls to be transferred from your cellular phone to the UConnect® system without terminating the call. To transfer an ongoing call from your UConnect® paired cellular phone to the UConnect® system or vice versa, press the "Voice Recognition" button and say "Transfer Call."

Connect or Disconnect Link Between the UConnect® System and Cellular Phone

Your cellular phone can be paired with many different electronic devices, but can only be actively "connected" with one electronic device at a time.

If you would like to connect or disconnect the Bluetooth® connection between a UConnect® paired cellular phone and the UConnect® system, follow the instructions described in your cellular phone User's Manual.

List Paired Cellular Phone Names

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Setup Phone Pairing."
- When prompted, say "List Phones."
- The UConnect® system will play the phone names of all paired cellular phones in order from the highest to the lowest priority. To "select" or "delete" a paired phone being announced, press the "Voice Recognition" button and say "Select" or "Delete." Also, see the next two sections for an alternate way to "select" or "delete" a paired phone.

Select Another Cellular Phone

This feature allows you to select and start using another phone paired with the UConnect® system.

- Press the PHONE button to begin.

- After the "Ready" prompt and the following beep, say "Setup Select Phone" and follow the prompts.
- You can also press the "Voice Recognition" button at any time while the list is being played, and then choose the phone that you wish to select.
- The selected phone will be used for the next phone call. If the selected phone is not available, the UConnect® system will return to using the highest priority phone present in or near (approximately within 30 ft [9 m]) the vehicle.

Delete UConnect® Paired Cellular Phones

- Press the PHONE button to begin.
- After the "Ready" prompt and the following beep, say "Setup Phone Pairing."
- At the next prompt, say "Delete" and follow the prompts.
- You can also press the "Voice Recognition" button at any time while the list is being played, and then choose the phone you wish to delete.

Things You Should Know About Your UConnect® System

UConnect® Tutorial

To hear a brief tutorial of the system features, press the PHONE button and say "UConnect® Tutorial."

Voice Training

For users experiencing difficulty with the system recognizing their voice commands or numbers, the UConnect® system Voice Training feature may be used. To enter this training mode, follow one of the two following procedures:

From outside the UConnect® mode (e.g., from radio mode):

- Press and hold the "Voice Recognition" button for five seconds until the session begins, or,

- Press the "Voice Recognition" button and say the "Setup, Voice Training" command.

Repeat the words and phrases when prompted by the UConnect® system. For best results, the Voice Training session should be completed when the vehicle is parked with the engine running, all windows closed, and the blower fan switched OFF.

This procedure may be repeated with a new user. The system will adapt to the last trained voice only.

To restore the Voice Recognition system to factory default settings, enter the Voice Training session via the above procedure and follow the prompts.

Voice Recognition (VR)

- For best performance, adjust the rearview mirror to provide at least ½ in (1 cm) gap between the overhead console (if equipped) and the mirror.
- Always wait for the beep before speaking.
- Speak normally, without pausing, just as you would speak to a person sitting a few feet/meters away from you.
- Make sure that no one other than you is speaking during a voice recognition period.
- Performance is maximized under:
  - low-to-medium blower setting,
  - low-to-medium vehicle speed,
  - low road noise,
  - smooth road surface,
  - fully closed windows,
  - dry weather condition.

- Even though the system is designed for users speaking in North American English, French, and Spanish accents, the system may not always work for some.
- When navigating through an automated system such as voice mail, or when sending a page, at the end of speaking the digit string, make sure to say "Send."
- Storing names in the phonebook when the vehicle is not in motion is recommended.
- It is not recommended to store similar sounding names in the UConnect® phonebook.
- The UConnect® phonebook nametag recognition rate is optimized for the person who stored the name in the phonebook.
- You can say "O" (letter "O") for "0" (zero). "800" must be spoken "eight-zero-zero."
- Even though international dialing for most number combinations is supported, some shortcut dialing number combinations may not be supported.
- In a convertible vehicle, system performance may be compromised with the convertible top down.

Far End Audio Performance

- Audio quality is maximized under:
  - low-to-medium blower setting,
  - low-to-medium vehicle speed,
  - low road noise,
  - smooth road surface,
  - fully closed windows,
  - dry weather conditions, and
  - operation from the drivers seat.

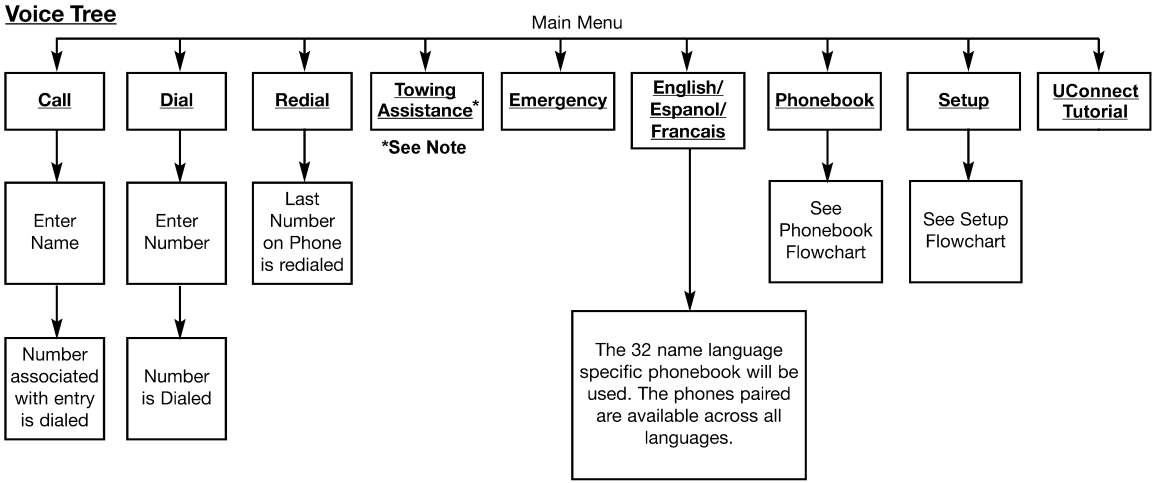
- Performance, such as audio clarity, echo, and loudness to a large degree rely on the phone and network, and not the UConnect® system.
- Echo at the far end can sometimes be reduced by lowering the in-vehicle audio volume.
- In a convertible vehicle, system performance may be compromised with the convertible top down.

Bluetooth® Communication Link

Cellular phones have been found to lose connection to the UConnect® system. When this happens, the connection can generally be re-established by switching the phone off/on. Your cell phone is recommended to remain in Bluetooth® ON mode.

Power-Up

After switching the ignition key from OFF to either ON or ACC position, or after a language change, you must wait at least five seconds prior to using the system.



***Note: Do not use the towing assistance feature in the UConnect System. For towing assistance, call the Customer Assistance Center, 1-800-785-4357.**

Note: Available Voice commands are shown in bold face and are underlined.

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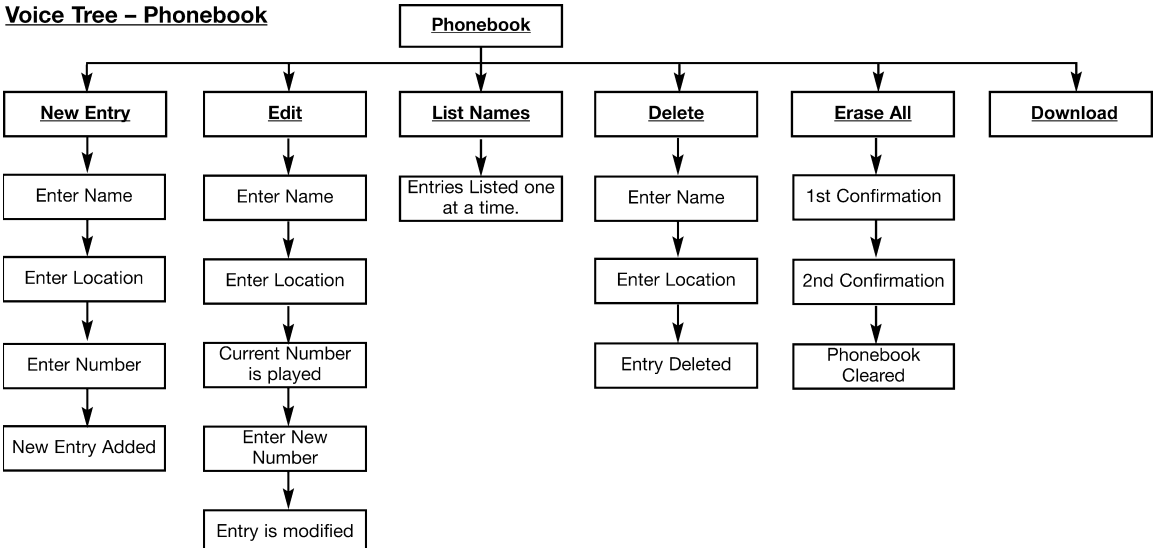
Voice Tree – Phonebook



Note: **Available Voice commands are shown in bold face and are underlined.**

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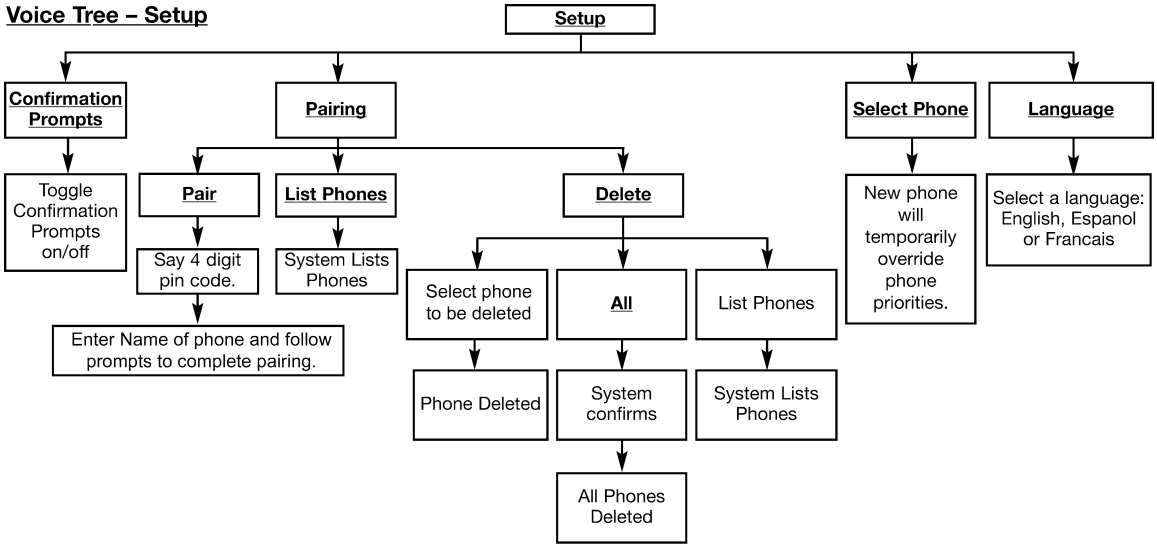
Voice Tree – Setup



Note: **Available Voice commands are shown in bold face and are underlined.** 819402e4

Voice Commands	
Primary	Alternate(s)
zero	
one	
two	
three	
four	
five	
six	
seven	
eight	
nine	
star (*)	
plus (+)	
pound (#)	
add location	
all	

Voice Commands	
Primary	Alternate(s)
call	
cancel	
confirmation prompts	
continue	
delete	
dial	
download	
edit	
emergency	
English	
erase all	
Espanol	
Francais	
help	
home	

Voice Commands	
Primary	Alternate(s)
language	
list names	
list phones	
mobile	
mute	
mute off	
new entry	
no	
pager	
pair a phone	
phone pairing	pairing
phonebook	phone book
previous	
record again	
redial	

Voice Commands	
Primary	Alternate(s)
return to main menu	return or main menu
select phone	select
send	
set up	phone settings or phone set up
towing assistance	
transfer call	
UConnect® Tutorial	
try again	
voice training	
work	
yes	

General Information

This device complies with Part 15 of the FCC rules and RSS 210 of Industry Canada. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

SEATS

The seating options available in this truck are the result of extensive customer research and evaluations.

Seats are also a primary part of the Occupant Restraint (protection) System of the vehicle. They need to be used properly for safe operation of the vehicle.

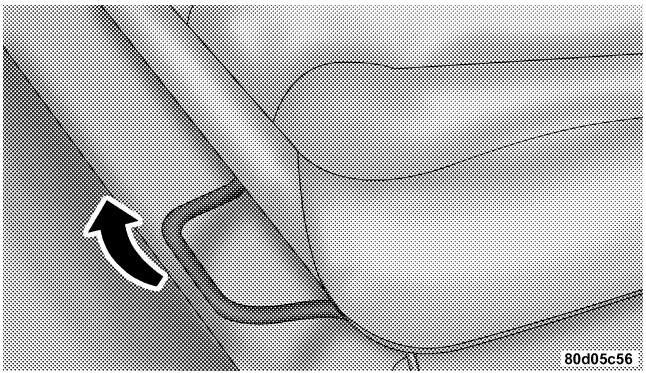
WARNING!

It is extremely dangerous to ride in a cargo area, inside or outside of a vehicle. In a collision, people riding in these areas are more likely to be seriously injured or killed.

Do not allow people to ride in any area of your vehicle that is not equipped with seats and seat belts.

Be sure everyone in your vehicle is in a seat and using a seat belt properly.

40-20-40 Front Seat



Manual Seat Adjuster

As the name implies, the seat is divided into three segments. The outboard seat portions are each 40% of the total width of the seat. The back of the center portion (20%) easily folds down to provide an armrest/center storage compartment (if equipped).

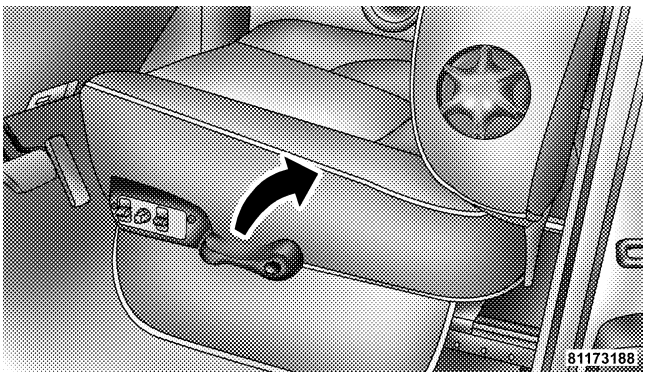
Each outboard seat is independently adjustable forward or rearward and is equipped with a back recliner. The manual forward or rearward seat adjustment handle is found at the front edge of each seat cushion. Pull up on the handle and slide the seat to get the most comfortable position.

WARNING!

Adjusting a seat while the vehicle is moving is dangerous. The sudden movement of the seat could cause you to lose control. The seat belt might not be properly adjusted and you could be injured. Adjust any seat only while the vehicle is parked.

Reclining Seats

The recliner handle is on the outside of the seat cushion. Pull up on the handle, as shown, to release the seatback and adjust for comfort.



Seat Recliner Handle

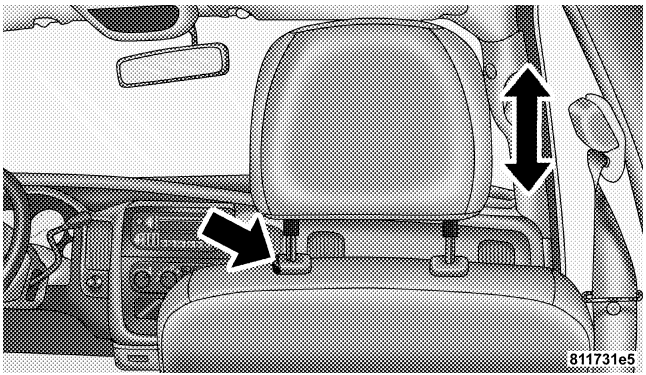
WARNING!

You can be seriously, even fatally, injured riding in a seat with the seatback reclined. Do not ride with the seatback reclined so that the shoulder belt is no longer resting against your chest. If you ride in this position, the shoulder harness will no longer be restraining you. In a collision you could slide under the seat belt and receive serious or fatal injuries. Recline in a seat only when the vehicle is parked.

Adjustable Head Restraints

Head restraints can reduce the risk of neck injury in the event of impact from the rear. Pull up or push down on the restraints so that the upper edge is as high as practical, at least to the level of the ears.

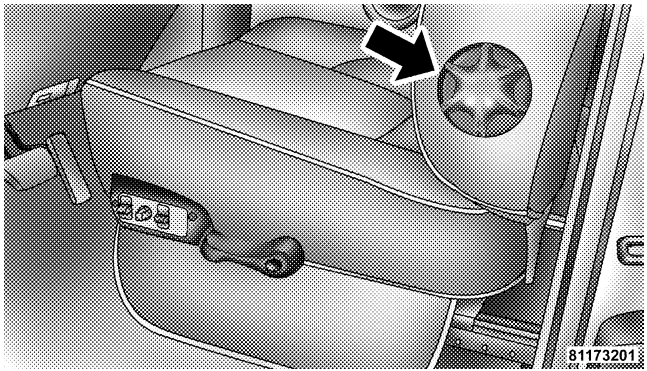
To lower the head restraint, push in the button and then push down on the head restraint.



Head Restraints

Manual Rotary Lumbar Support Adjustment — If Equipped

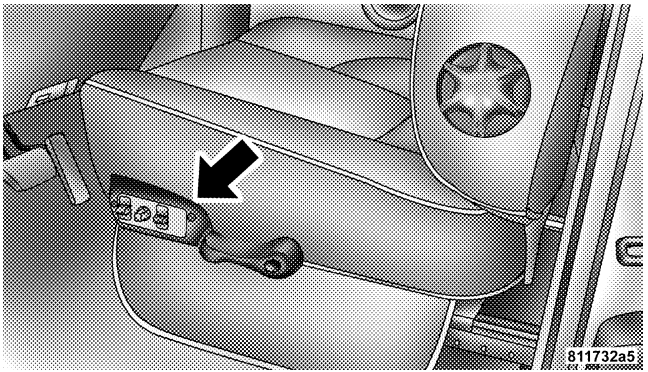
Rotating the lumbar control knob on the left side of the driver's seatback and on the right side of the passenger's seatback increases or decreases the lumbar (lower back) support.



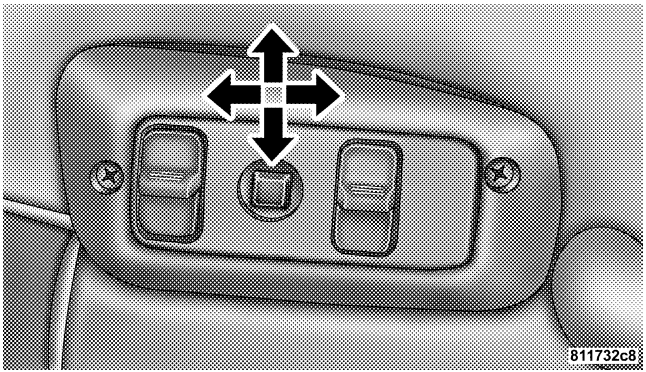
Manual Lumbar Adjustment

Power Seats — If Equipped

CAUTION!
Don't put anything under a power seat. It may cause damage to the seat controls.

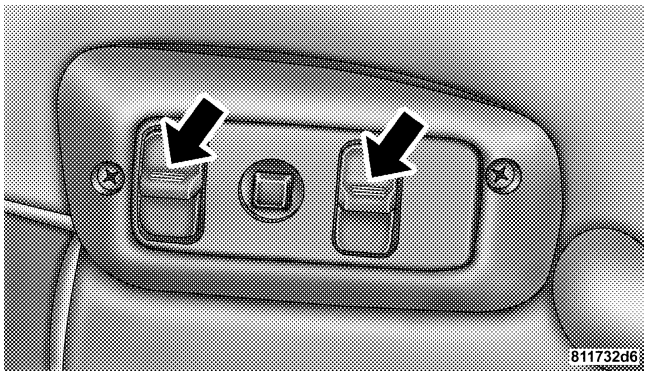


Power Seat Switch



Up, Down, Forward, and Rearward

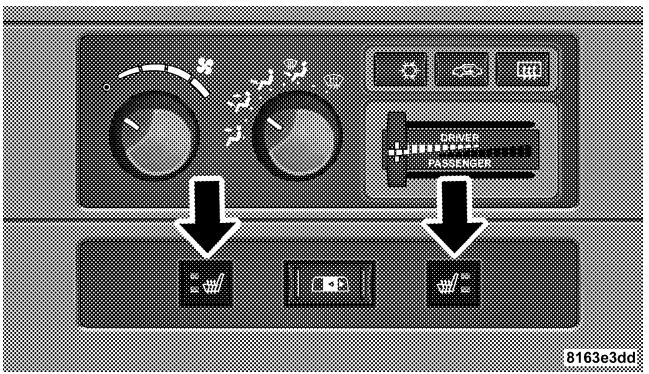
The power seat controls are on the outboard side of the front seat cushions. Three switches control the seat movement. The four-way switch in the center can be moved forward or backward to get the most comfortable position. The same switch can be moved up and down to control seat height. Change the seat angle by using the two toggle switches, tilting it up or down.



Tilt Adjustment

Heated Seats — If Equipped

The heated seat switches are located in the instrument panel under the climate controls.



Heated Seat Switches

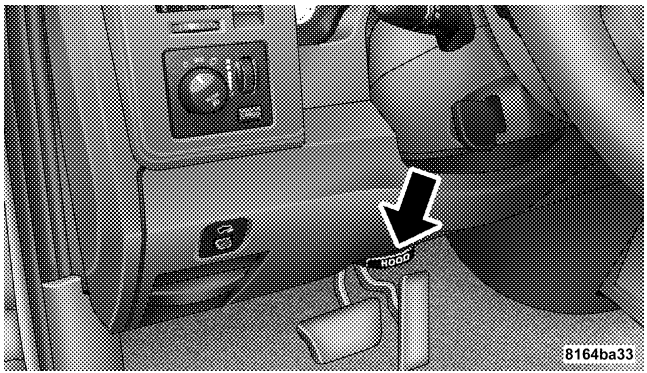
Each heated seat switch has two settings (HI and LOW). Press the switch once to obtain High heat level, then press the switch again to obtain Low heat level. Pressing the switch a third time will turn the heated seats OFF. If you do not purposefully turn the switch OFF, the seat heating level will automatically change to the next lower level, or OFF. The High heat level operates for 30 minutes (approximately); the Low heat level operates for 30 minutes (approximate). The seat heat will also turn off when the ignition is turned OFF. Both of the indicators ON identifies High heat level. The lower indicator ON only, identifies Low heat level. Flashing indicator lights on the switch indicate that the Heated Seat System needs servicing.

WARNING!

Persons who are unable to feel pain to the skin because of advanced age, chronic illness, diabetes, spinal cord injury, medication, alcohol use, exhaustion or other physical condition must exercise care when using the seat heater. It may cause burns even at low temperatures, especially if used for long periods of time.

Do not place anything on the seat that insulates against heat, such as a blanket or cushion. This may cause the seat heater to overheat.

TO OPEN AND CLOSE THE HOOD

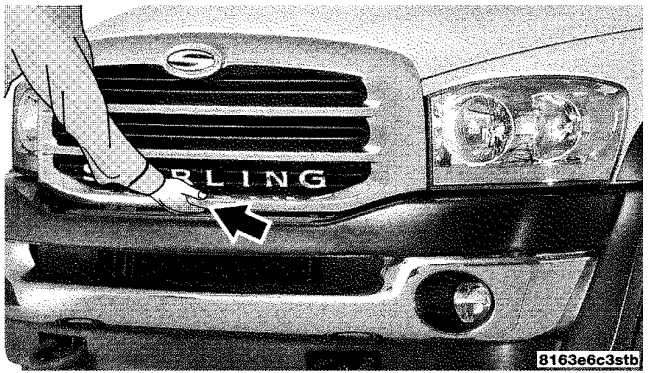


Hood Release Lever

To open the hood, two latches must be released. First pull the hood release lever located below the steering wheel at the base of the instrument panel. Once the hood is

released you must reach into the opening beneath the center of the grille and push up the latch to release the safety catch before raising the hood.

To prevent possible damage, do not slam the hood to close it. Use a firm downward push at the front center of the hood to ensure that both latches engage.

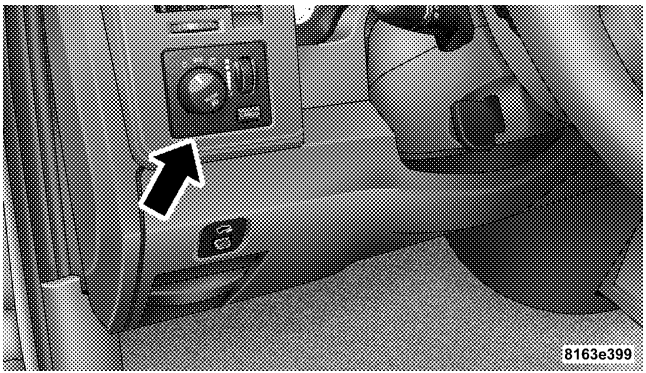


Sterling Secondary Latch

WARNING!

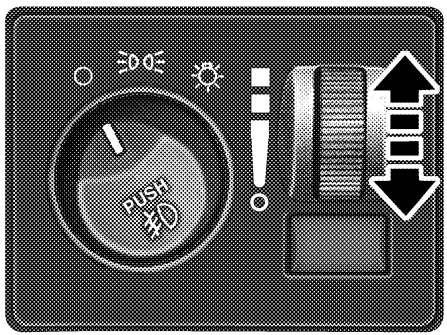
If the hood is not fully latched, it could fly up when the vehicle is moving and block your forward vision. Be sure all hood latches are latched fully before driving.

LIGHTS



Headlight Switch Location

Interior Lights



Dimmer Control

Courtesy and dome lights are turned on when the front doors are opened, when the dimmer control (rotating wheel on the right side of the switch) is rotated to the upward detent position, or if equipped, when the UNLOCK button is pressed on the key fob. When a door is

open and the interior lights are on, rotating the dimmer control all the way down to the OFF detent will cause all the interior lights to go out. This is also known as the "Party" mode because it allows the doors to stay open for extended periods of time without discharging the vehicle's battery.

The brightness of the instrument panel lighting can be regulated by rotating the dimmer control up (brighter) or down (dimmer). When the headlights are ON you can supplement the brightness of the odometer, trip odometer, radio and overhead console by rotating the control up until you hear a click. This feature is termed the "Parade" mode and is useful when headlights are required during the day.

Quad Cab® models may have an optional switched dome lamp that may be operated by pressing the lens.

Battery Saver

To protect the life of your vehicle's battery, load shedding is provided for both the interior and exterior lights.

If the ignition is OFF and any door is left ajar for 10 minutes or the dimmer control is rotated upwards for 10 minutes, the interior lights will automatically turn off.

If the headlamps remain on while the ignition is cycled OFF, the exterior lights will automatically turn off after 8 minutes. If the headlamps are turned on and left on for 8 minutes while the ignition is OFF, the exterior lights will automatically turn off.

NOTE: Battery saver mode is cancelled if the ignition is ON.

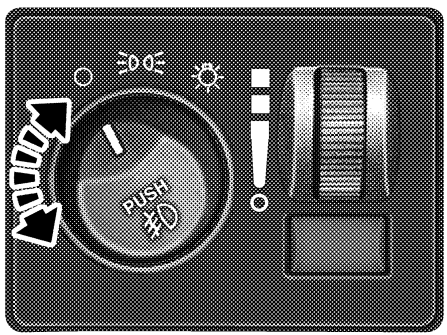
Headlamp Delay

To aid in your exit, your vehicle is equipped with a headlight delay that will leave the headlights on for 90 seconds. This delay is initiated when the ignition is turned OFF while the headlight switch is ON, and then the headlightp switch is cycled OFF. Headlight delay can be cancelled by either turning the headlight switch ON then OFF, or by turning the ignition ON.

The headlight delay time is programmable on vehicles equipped with the Electronic Vehicle Information Center (EVIC). For details, refer to "Personal Settings (Customer Programmable Features)" under "Overhead Console with Electronic Vehicle Information Center (EVIC) – If Equipped" in Section 3.

Headlights, Parking Lights, Panel Lights

When the headlight switch is rotated to the first position, the parking lights, taillights, side marker lights, license plate light and instrument panel lights are all turned on. The headlights will turn ON when the switch is rotated to the second position.



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Light Switch Rotation

Your vehicle is equipped with plastic headlight lenses that are lighter and less susceptible to stone breakage than glass headlights.

Plastic is not as scratch resistant as glass and therefore different lens cleaning procedures must be followed.

To minimize the possibility of scratching the lenses and reducing light output, avoid wiping with a dry cloth. To remove road dirt, wash with a mild soap solution followed by rinsing.

Do not use abrasive cleaning components, solvents, steel wool or other abrasive materials to clean the lenses.

Daytime Running Lights (Canada Only and Fleet Vehicles)

The headlights on your vehicle will illuminate when the engine is started and the transmission is in any gear except PARK. This provides a constant "Lights ON" condition until the ignition is turned OFF. The lights illuminate at less than 50% of normal intensity. If the parking brake is applied the Daytime Running Lights (DRL) will turn OFF. Also, if a turn signal is activated, the DRL lamp on the same side of the vehicle will turn off for the duration of the turn signal activation. Once the turn signal is no longer active, the DRL lamp will illuminate.

Lights-on Reminder

If the headlights, parking lights, or cargo lights are left on after the ignition is turned OFF, a chime will sound when the driver's door is opened.

Fog Lights — If Equipped

The foglights are turned ON by placing the headlight rotary control in the parking light or headlight position and pushing in the headlight rotary control. The fog lights will operate only when the parking lights are ON or when the vehicle headlights are on low beam. An indicator light located in the instrument cluster will illuminate when the fog lights are on. The fog lights

will turn off when the switch is pushed a second time, when the headlight switch is rotated to the OFF position, or the high beam is selected.

Multifunction Control Lever

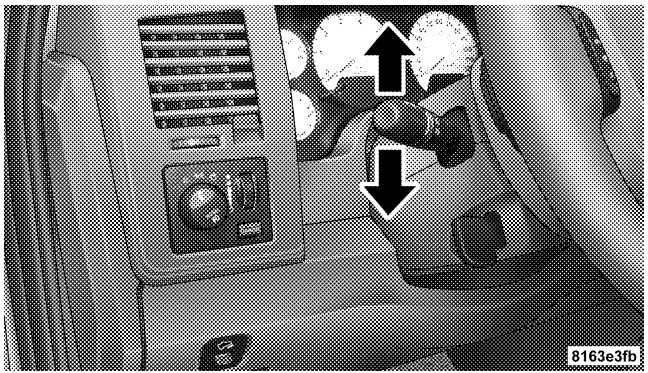
The multifunction control lever is located on the left side of the steering column.

Turn Signals

Move the lever up or down to signal a right-hand or left-hand turn.

The arrow on either side of the instrument cluster flashes to indicate the direction of the turn, and proper operation of the front and rear turn signal lights. If a defective bulb or wiring circuit is detected for the turn signal system, the arrow indicators will flash at a faster rate. If an indicator fails to light when the lever is moved, it would suggest that the switch or indicator lamp is defective.

You can signal a lane change by moving the lever partially up or down.



Turn Signal Lever

Turn Signal Auto-Mode

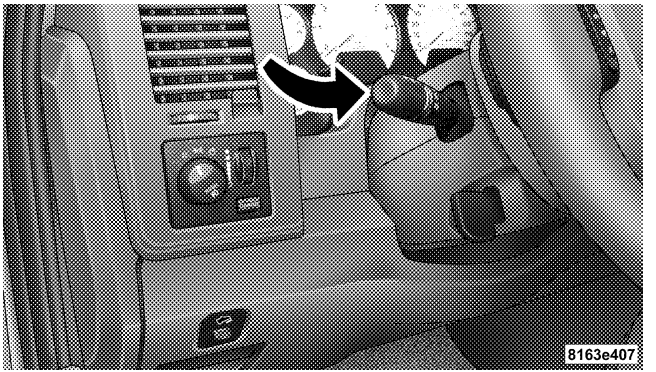
Tap the multifunction control lever once and the turn signal (left or right) will flash three times, and automatically turn off.

Passing Light

You can signal another vehicle with your headlights by partially pulling the multifunction lever toward the steering wheel. This will cause the high beam headlights to turn ON until the lever is released.

High Beam / Low Beam Select Switch

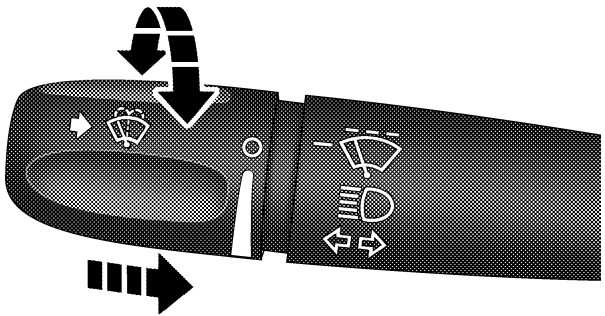
Pull the multifunction control lever fully toward the steering wheel to switch the headlights from HIGH or LOW beam.



High Beam / Low Beam

WINDSHIELD WIPERS AND WASHERS

Windshield Wipers



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Windshield Wiper / Washer Switch

The wipers and washers are operated by a switch in the multifunction control lever. Turn the end of the handle to select the desired wiper speed.

Intermittent Wiper System

The intermittent feature of this system was designed for use when weather conditions make a single wiping cycle, with a variable pause between cycles, desirable. For maximum delay between cycles, rotate the control knob into the upper end of the delay range.

The delay interval decreases as you rotate the knob until it enters the LOW continual speed position. The delay can be regulated from a maximum of about 15 seconds between cycles, to a cycle every two seconds. The delay intervals will double in duration when the vehicle speed is 10 mph (16 km/h) or less.

WARNING!

Sudden loss of visibility through the windshield could lead to an accident. You might not see other vehicles or other obstacles. To avoid sudden icing of the windshield during freezing weather, warm the windshield with the defroster before and during windshield washer use.

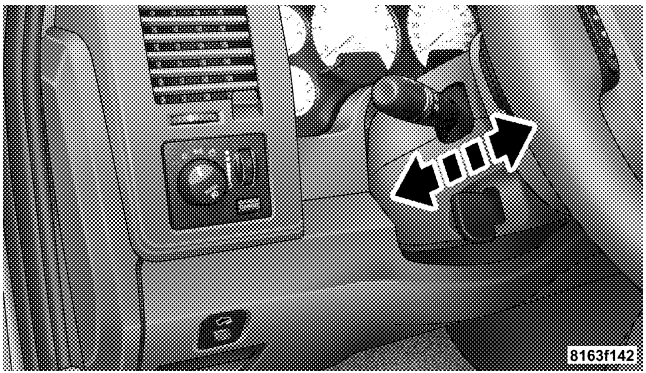
Windshield Washers

To use the washer, push in on the washer knob on the end of the multifunction control lever and hold while spray is desired. If the washer knob is depressed while in the delay range, the wiper will operate for several seconds after the washer knob is released. It will then resume the intermittent interval previously selected. If the washer knob is pushed for a period greater than one second while in the OFF position, the wiper will wipe approximately three wipes after the wash knob is released.

To prevent freeze-up of your windshield washer system in cold weather, select a solution or mixture that meets or exceeds the temperature range of your climate. This rating information can be found on most washer fluid containers.

TILT STEERING COLUMN

To tilt the column, pull rearward on the lever below the turn signal control and move the wheel up or down, as desired. Push the lever forward to lock the column firmly in place.

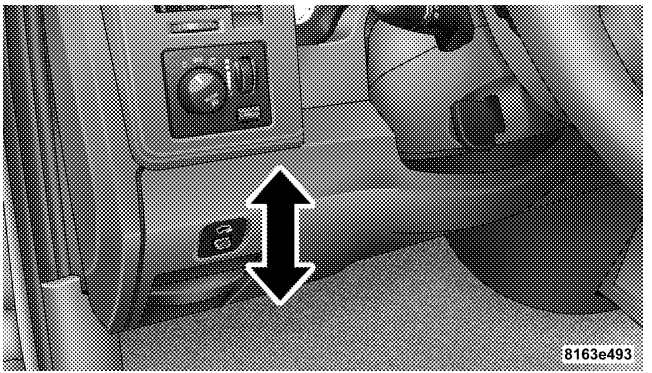


Tilt Steering Control Lever

WARNING!

Tilting the steering column while the vehicle is moving is dangerous. Without a stable steering column, you could lose control of the vehicle and have an accident. Adjust the column only while the vehicle is stopped. Be sure it is locked before driving.

DRIVER ADJUSTABLE PEDALS — IF EQUIPPED



Adjustable Pedals Switch

The power adjustable accelerator and brake pedals allow the driver to establish a comfortable position relative to the steering wheel and pedals.

Adjustment

1. Position the driver seat so that you are at least 10 in (254 mm) away from the airbag located in the center of the steering wheel.

2. Fasten and adjust the seatbelts.

3. Move the adjustable pedal switch, located to the left of the steering column near the parking brake release, in the direction you desire to move the pedals.

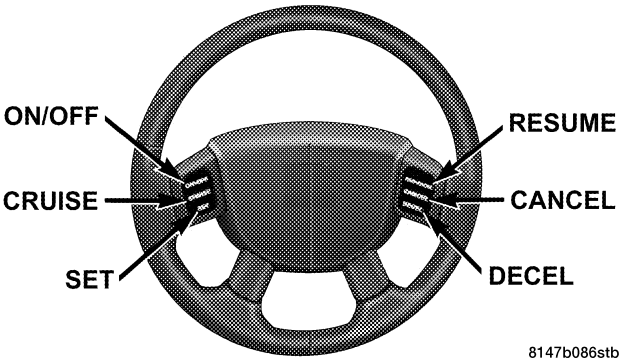
4. The pedals **cannot** be adjusted when the vehicle is in REVERSE or when the Electronic Speed Control is SET.

CAUTION!

Do not place any article under the adjustable pedals or impede its ability to move as it may cause damage to the pedal controls. Pedal travel may become limited if movement is stopped by an obstruction in the adjustable pedal's path.

ELECTRONIC SPEED CONTROL — IF EQUIPPED

When engaged, this device takes over accelerator operation at speeds greater than 25 mph (40 km/h). The controls are mounted on the steering wheel.



Electronic Speed Control Buttons

NOTE: The Electronic Speed Control System has been designed to shut down if multiple speed control switch buttons (i.e., SET and CANCEL) are operated simultaneously, in order to ensure proper operation. The system

can be reactivated by pushing the speed control switch ON/OFF button and re-establishing the desired vehicle SET speed.

To Activate

Push the ON/OFF button to the ON position. An indicator light in the instrument cluster illuminates when the system is on.

To Set At A Desired Speed

When the vehicle has reached the desired speed, press and release the SET button. Release the accelerator and the vehicle will operate at the selected speed.

To Deactivate

A soft tap on the brake pedal, normal braking, clutch pressure while slowing the vehicle, or pressing the CANCEL button will deactivate speed control without erasing the memory. Pushing the ON/OFF button to the OFF position or turning off the ignition erases the memory.

WARNING!

Leaving the speed control ON when not in use is dangerous. You could accidentally set the system to cause it to go faster than you want. You could lose control and have an accident. Always leave the system OFF when you aren't using it.

To Resume Speed

To resume a previously set speed, push and release the RESUME button. Resume can be used at any speed above 30 mph (50 km/h).

To Vary The Speed Setting

When the speed control is on, speed can be increased by pressing and holding the RESUME/ACCEL button. When the button is released, a new set speed will be established.

Tapping the ACCEL button once will result in a speed increase of 1 mph (2 km/h). Each time the button is tapped, speed increases so that tapping the button three times will increase speed by 3 mph (4.8 km/h).

Tapping the DECEL button once will result in a speed decrease of 1 mph (2 km/h). Each time the button is tapped, speed will decrease. For example, tapping the button three times will decrease the speed by 3 mph (4.8 km/h)

To decrease speed while the speed control is on, press and hold the DECEL button. Release the button when the desired speed is reached, and the new speed will be set.

To Accelerate For Passing

Depress the accelerator as you would normally. When the pedal is released, the vehicle will return to the set speed.

NOTE: When driving uphill, at elevations above 2,000 ft (610 m), or when the vehicle is heavily loaded (especially when towing) the vehicle may slow below the SET speed. If the vehicle speed drops below 25 mph (40 km/h), the speed control will automatically disengage. If this happens, you can push down on the accelerator pedal to maintain the desired speed.

Vehicles equipped with a 6–speed manual transmission should be operated in 4th or 5th gear under the above conditions.

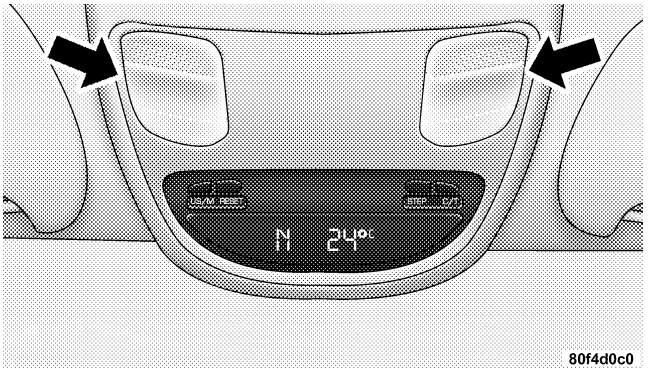
WARNING!

Speed control can be dangerous where the system can't maintain a constant speed. Your vehicle could go too fast for the conditions, and you could lose control. An accident could be the result. Don't use speed control in heavy traffic or on roads that are winding, icy, snow-covered, or slippery.

OVERHEAD CONSOLE WITH COMPASS/TEMPERATURE MINI-TRIP COMPUTER — IF EQUIPPED

This optional overhead console consists of the following:

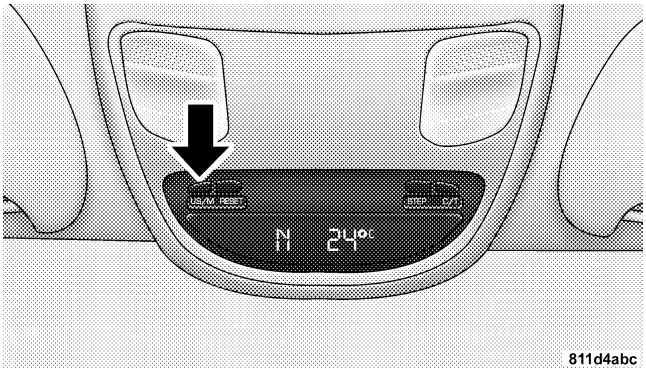
- Courtesy Lights
- Compass/Temperature Mini-Trip Computer (CMTC)



Courtesy Lights

This overhead console allows you to choose between a compass/temperature display and one of four trip conditions being monitored.

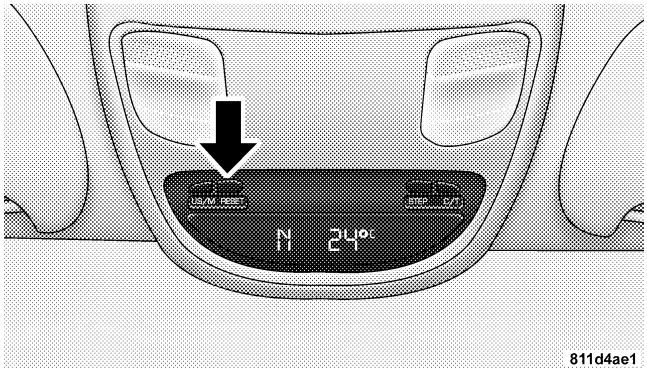
US/M Button



US/M Button

Use this button to change the display from U.S. to metric measurement units.

RESET Button



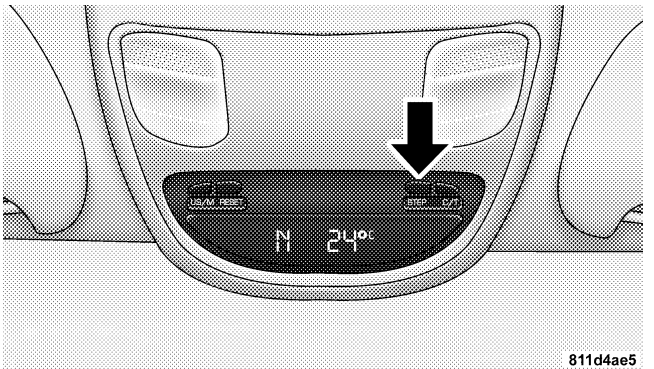
Reset Button

Use this button to reset the following displays:
Average Fuel Economy (AVG ECO)
Trip Odometer (ODO)
Elapsed Time (ET)

Global Reset

If the RESET button is pressed twice within two seconds while in any of the three resettable displays (AVG ECO, ODO, ET), the Global Reset will reset all three displays.

Step Button



Step Button

Use this button to choose or cycle through the four trip conditions.

Average Fuel Economy (AVG ECO)

Shows the average fuel economy since the last reset. Average fuel economy is a running average of the amount of fuel used and the distance the vehicle has traveled.

When the fuel economy is reset, the display will momentarily blank. Then the history will be erased and the AVERAGING WILL CONTINUE FROM WHERE IT WAS BEFORE THE RESET. The reset value is based on a minimal amount of fuel used and the distance traveled from the previous drive cycle. The display **may take several miles/kilometers** for this value to change, dependent upon driving habits.

Distance To Empty (DTE)

Shows the estimated distance that can be traveled with the fuel remaining in the tank. This estimated distance is determined by weighted average of the instantaneous and average fuel economy, according to the current fuel tank level. This is not resettable.

NOTE: Significant changes in driving style or vehicle loading will greatly affect the actual drivable distance of the vehicle, regardless of the DTE displayed value.

When the DTE value is less than 30 mi (48 km) estimated driving distance, the DTE display will change to an alternating text display of "LO" and "FUEL." This display will continue until the vehicle runs out of fuel. Adding a significant amount of fuel to the vehicle will turn off the "LO FUEL" text and a new DTE value will be displayed, based on the current values in the DTE calculation and the current fuel tank level.

NOTE: It is possible for DTE to display "LO FUEL" before the low fuel warning light turns on in the instrument cluster. This could occur because low fuel warning is set to a specified fuel tank volume and DTE is an estimated distance calculation based on fuel economy and remaining fuel tank volume.

Ram fuel tank volumes are as follows:

- 52 gal (196 L) - Standard rear tank
- 22 gal (83 L) - Optional midship tank

Trip Odometer (ODO)

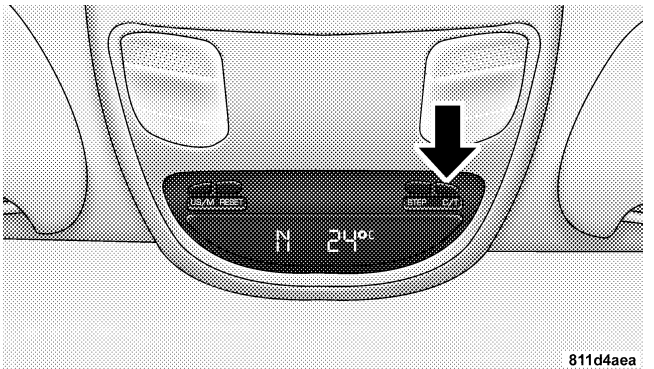
NOTE: The maximum value is approximately 6,000 mi (9,657 km). Then the trip odometer must be reset in order to update the trip odometer miles/kilometers.

This display shows the distance traveled since the last reset. Resetting of this screen will cause the trip odometer to change to zero.

Elapsed Time (ET)

This display shows the accumulated ignition ON time since the last reset. Resetting the elapsed time will cause the display to change to zero.

C/T Button



C/T Button

Use this button to select a readout of the outside temperature and one of eight compass headings that indicate the direction in which the vehicle is facing.

WARNING!

Even if the display still reads a few degrees above 32°F (0°C), the road surface may be icy, particularly in woods or on bridges. Drive carefully under such conditions to prevent an accident and possible personal injury or property damage.

Automatic Compass Calibration

This compass is self-calibrating, which eliminates the need to manually set the compass. When the vehicle is new the compass may appear erratic and the CAL symbol will be displayed.

After completing up to three 360° turns, with the vehicle traveling less than 5 mph (8 km/h), in an area free from large metal or metallic objects, the CAL symbol will turn off and the compass will function normally.

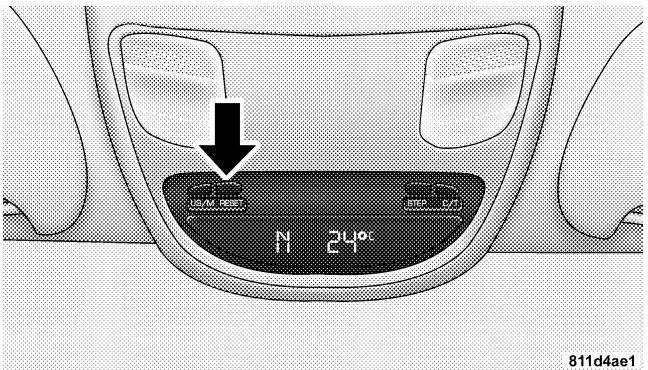
Manual Compass Calibration

NOTE: To ensure proper compass calibration, make sure the compass variance is properly set before manually calibrating the compass.

If the compass appears erratic and the CAL symbol does not appear, you must manually put the compass into the "Calibration" mode.

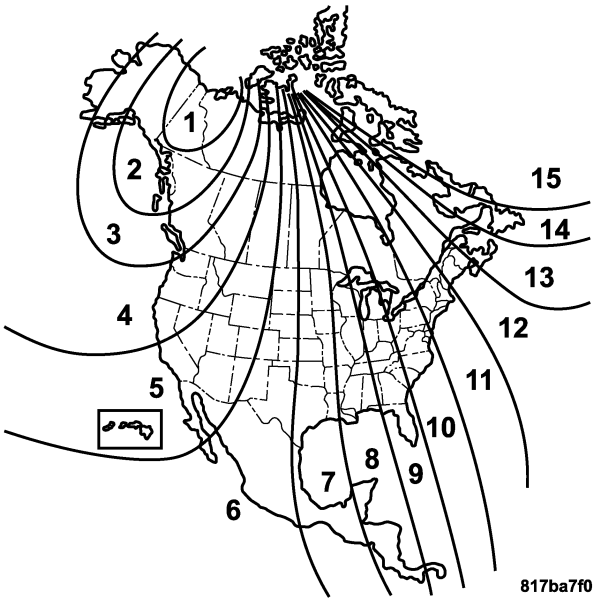
Recalibrating The Compass

Turn on the ignition and set the display to "Compass/ Temperature." Press and hold the RESET button to change the display between VAR (compass variance) and CAL (compass calibration) modes. When the CAL symbol is displayed, slowly drive the vehicle 5 mph (8 km/h) in a complete 360° circle in an area free from large metal objects or power lines. The CAL symbol will turn off and the compass will function normally.



Reset Button

Compass Variance is the difference between magnetic north and geographic north. In some areas of the country, the difference between magnetic and geographic north is great enough to cause the compass to give false readings. If this occurs, the compass variance must be set according to the Compass Variance Map.



NOTE: The default for the compass variance is zone 8.

To set the variance: Turn the ignition ON and set the display to "Compass/Temperature." Press and hold the RESET button approximately five seconds. The last variance zone number will be displayed. Press the STEP button to select the new variance zone and press the RESET button to resume normal operation.

Outside Temperature

Because the ambient temperature sensor is located underhood, engine temperature can influence the displayed temperature. Therefore, temperature readings are slowly updated when the vehicle speed is below 20 mph (30 km/h) or during stop-and-go driving.

OVERHEAD CONSOLE WITH ELECTRONIC VEHICLE INFORMATION CENTER (EVIC) — DIESEL ONLY

The overhead console contains dome/reading lights, and an Electronic Vehicle Information Center (EVIC).

Dome/Reading Lights

Located in the overhead console are two dome/reading lights.

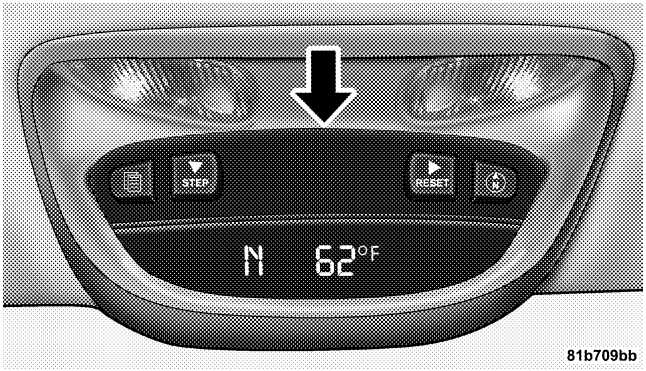
The dome/reading lights illuminate when a door is opened or when the interior lights are turned on by rotating the dimmer control located on the headlight switch.

The reading lights are activated by pressing on the recessed area of the corresponding lens.

NOTE: The dome/reading lights will remain on until the switch is pressed a second time, so be sure they have been turned off before leaving the vehicle.

Dome/Reading Lights

Electronic Vehicle Information Center (EVIC) — If Equipped



Overhead Console With EVIC

Pressing the Menu button will change the display to one of the following features:

Trip Functions

Pressing the STEP button allows you to scroll through one of the following Trip Function features:

- TRIP – Shows the total distance traveled since the last reset. To reset the TRIP function, press and hold the RESET button.
- ELAPSED TIME – Shows the total elapsed time of travel since the last reset. Elapsed time will increment when the ignition switch is in the ON/RUN or START positions.
- UNIT IN US/METRIC – Press the RESET button to toggle between US and METRIC.

- AVG. MPG – Shows the average fuel economy since the last reset. When the fuel economy is reset, the display will show dashes for two seconds. Then the history information will be erased, and the averaging will continue from the last fuel average reading before the reset. (Example: If your EVIC displays 18 AVG. MPG and the RESET button is pressed, the previous averaging history will be erased and the display will return to the 18 AVG. MPG, not to 0 AVG. MPG.) The display may take several miles/kilometers for the value to change, dependent upon driving habits.
- MI TO EMPTY (Distance to Empty) – Shows the estimated distance that can be traveled with the fuel remaining in the tank. This estimated distance is determined by a weighted average of fuel economy, according to the current fuel tank level. MI TO EMPTY cannot be reset through the RESET button.

NOTE: Significant changes in driving style or vehicle loading will greatly affect the actual drivable distance of the vehicle, regardless of the DTE displayed value.

- When the DTE value is less than 30 mi (48 km) estimated driving distance, the DTE display will change to a text display of ″LOW FUEL.″ This display will continue until the vehicle runs out of fuel. Adding a significant amount of fuel to the vehicle will turn off the ″LOW FUEL″ text and a new DTE value will display.

System Status (EVIC Displays)

When the appropriate conditions exist, the EVIC displays the following messages:

- TURN SIGNALS ON (with a continuous warning chime)
- PERSONAL SETTINGS NOT AVAILABLE – Vehicle not in PARK

- LEFT/RIGHT FRONT DOOR AJAR (one or more, with a single chime if speed is above 1 mph (1.6 km/h)
- LEFT/RIGHT REAR DOOR AJAR (one or more, with a single chime if speed is above 1 mph (1.6 km/h)
- DOOR(S) AJAR (with a single chime if vehicle is in motion)
- LOW WASHER FLUID (with a single chime)
- OIL CHANGE REQUIRED (with a single chime)
- CATALYST FULL SEE OWNER MANUAL
- CATALYST STAT lllllll 90%
- CATALYST FULL SERVICE REQUIRED
- SERVICE AIR FILTER
- SERVICE CCV FILTER

OIL CHANGE REQUIRED — If Equipped

Your vehicle is equipped with an engine oil change indicator system. The "Oil Change Required" message will flash in the EVIC display for approximately 10 seconds after a single chime has sounded to indicate the next scheduled oil change interval. The engine oil change indicator system is duty cycle based, which means the engine oil change interval may fluctuate, dependent upon your personal driving style.

Unless reset, this message will continue to display each time you turn the ignition switch to the ON/RUN position. To turn off the message temporarily, press and release the Menu button. To reset the oil change indicator system (after performing the scheduled maintenance) use the following procedure.

1. Turn the ignition switch to the ON position **(Do not start the engine).**

2. Fully depress the accelerator pedal slowly three times within 10 seconds.

3. Turn the ignition switch to the OFF/LOCK position.

NOTE: If the indicator message illuminates when you start the vehicle, the oil change indicator system did not reset. If necessary, repeat this procedure.

Personal Settings (Customer Programmable Features)

Personal Settings allows the driver to set and recall features when the transmission is in PARK. If the transmission is not in PARK, the EVIC will display NOT AVAILABLE and VEHICLE NOT IN PARK.

Press and release the Menu button until the Personal Settings displays on the EVIC.

Use the STEP button to display one of the following:

- "LANGUAGE" – When in this display you may select one of three languages for all display nomenclature, including the trip functions. Press the RESET button while in this display to select English, Espanol, or Francais. Then, as you continue, the information will display in the selected language.
- "AUTO DOOR LOCKS > ON" – When ON is selected, all doors will lock automatically when the vehicle reaches a speed of 15 mph (24 km/h). To make your selection, press and release the RESET button until "ON" or "OFF" appears.
- "AUTO UNLOCK ON EXIT > ON" – When ON is selected, all doors will unlock when the vehicle is stopped and the transmission is in the PARK or NEUTRAL position and the driver's door is opened. To make your selection, press and release the RESET button until "ON" or "OFF" appears.

- "RKE UNLOCK DRV DR 1st" – When **DRV DR 1st** is selected, only the driver's door will unlock on the first press of the remote keyless entry UNLOCK button. When Driver Door 1st Press is selected, you must press the remote keyless entry UNLOCK button twice to unlock the passenger's doors. To make your selection, press and release the RESET button until "DRV DR 1st " appears.
- "RKE UNLOCK ALL DR 1ST" – When **ALL DR 1ST** is selected, all of the doors will unlock on the first press of the remote keyless entry unlock button. To make your selection, press and release the RESET button until "All DR 1st" appears.
- "SOUND HORN W/LOCK > ON" – When ON is selected, a short horn sound will occur when the remote keyless entry LOCK button is pressed. This feature may be selected with or without the flash lights on lock/unlock feature. To make your selection, press and release the RESET button until "ON" or "OFF" appears.
- "FLASH LIGHTS W/LOCK > ON" – When ON is selected, the front and rear turn signals will flash when the doors are locked or unlocked with the remote keyless entry transmitter. This feature may be selected with or without the sound horn on lock feature selected. To make your selection, press and release the RESET button until "ON" or "OFF" appears.
- "HEAD LAMP OFF DELAY > 0 SEC" – When this feature is selected, the driver can choose to have the headlights remain on for 0, 30, 60, or 90 seconds when exiting the vehicle. To make your selection, press and release the RESET button until "0," "30," "60," or "90" appears.

- "KEY OFF POWER DELAY > OFF" – When this feature is selected, the power window switches, radio, hands–free system (if equipped), and power outlets will remain active for up to 10 minutes after the ignition switch is turned OFF. Opening a vehicle door will cancel this feature. To make your selection, press and release the RESET button until "Off," "45 sec.," "5 min.," "10 min." appears.
- "ILLUMINATED APRCH > OFF" – When this feature is selected, the headlights will activate and remain on for up to 90 seconds when the doors are unlocked with the remote keyless entry transmitter. To make your selection, press and release the RESET button until "OFF," "30 sec.," "60 sec.," or "90 sec." appears.

NOTE: If this feature is enabled, the headlamps will be on during the engine pre-heat and cold crank; therefore, it is recommended that the feature be disabled when overnight ambient temperature is at or below 20°F (-7°C) to prevent excessive drain on batteries during cold cranking.

- "UNIT IN > US/METRIC" – The EVIC and odometer display can be changed between English and Metric units of measure. To make your selection, press and release the RESET button until "US" or "METRIC" appears.
- "COMPASS VARIANCE > 8" – Press the RESET button to change the compass variance setting. For additional information, refer to "Compass Variance" in this section.
- "COMPASS CALIBRATE > YES" – Press the RESET button to calibrate the compass. For additional information, refer to "Compass Calibrate" in this section.

Compass/Temperature Button

Pressing the Compass/Temperature button will return the display to the normal compass/temperature display.

NOTE: Temperature accuracy can be affected from heat soak. For best accuracy, the vehicle should be driven at a speed greater than 25 mph (40 km/h) for several minutes.

Automatic Compass Calibration

This compass is self-calibrating, which eliminates the need to set the compass manually. When the vehicle is new, the compass may appear erratic and the EVIC will display "CAL" until the compass is calibrated. You may also calibrate the compass by completing one or more 360° turns (in an area free from large metal or metallic objects) until the "CAL" message displayed in the EVIC turns off. The compass will now function normally.

Manual Compass Calibration

If the compass appears erratic and the "CAL" message does not appear in the EVIC display, you must put the compass into the Calibration Mode manually as follows:

1. **Turn the ignition switch to the ON/RUN position.**

2. **Press the Menu button** until Personal Settings is displayed.

3. **Press the STEP button** until "Calibrate Compass YES" is displayed.

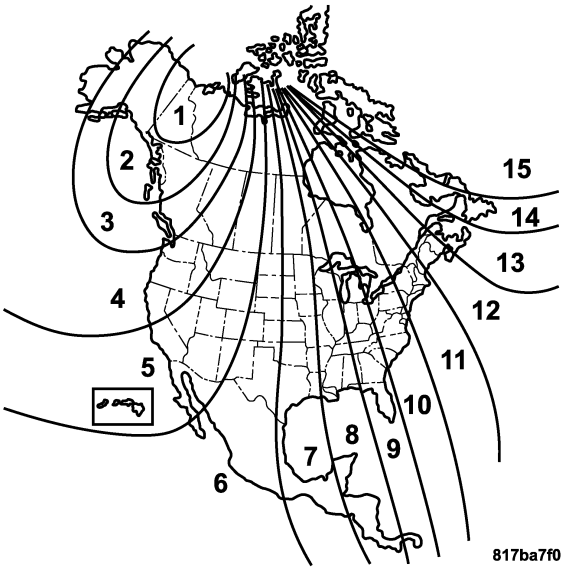
4. **Press and release the RESET button** to start the calibration. The message "CAL" will display in the EVIC.

5. Slowly drive the vehicle 5 mph (8 km/h) in a complete 360° circle (in an area free from large metal or metallic objects) until the "CAL" message turns off. The compass will now function normally.

Compass Variance

Compass Variance is the difference between magnetic North and Geographic North. In some areas of the country, the difference between magnetic and geographic North is great enough to cause the compass to give false readings. If this occurs, the compass variance must be set using the following procedure:

NOTE: Magnetic materials should be kept away from the overhead console. This is where the compass sensor is located.



Compass Variance Map

1. **Turn the ignition switch to the ON/RUN position.**

2. **Press the Menu button** until Personal Settings is displayed.

3. **Press the STEP button** until "Compass Variance" is displayed.

4. **Press and release RESET button** until the proper variance zone is selected according to the map.

5. **Press and release the Compass button** to exit.

ELECTRICAL POWER OUTLETS

The auxiliary electrical outlet can provide power for in-cab accessories designed for use with the standard "cigar lighter" plug. The outlet is located in the instrument panel below and to the right of the Climate Control Panel. A cap is attached to the outlet base indicating "Power Outlet" 12 Volt -20A.

There is an additional power outlet inside the center console of vehicles equipped with 40-20-40, or Bucket front seats. There is also a power outlet located on the rear of the center console for Quad Cab® vehicles equipped with bucket seats.

The outlet(s) has/have a fused direct feed from the battery so it/they receive power whether the ignition is ON or OFF.

All accessories connected to this/these outlet(s) should be removed or turned OFF when the vehicle is not in use to protect the battery against discharge.

NOTE: If desired, all of the power outlets can be converted by your authorized dealer to provide power with the ignition switch in the ON position only.

CAUTION!

Electrical Outlet Use With Engine Off

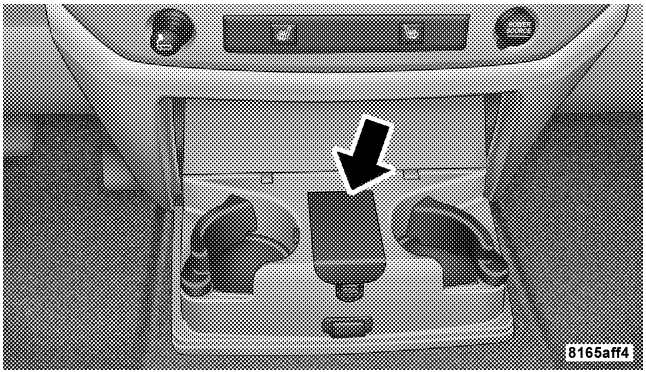
- **Many accessories that can be plugged in draw power from the vehicle's battery, even when not in use (i.e., cellular phones, etc.). Eventually, if plugged in long enough, the vehicle's battery will discharge sufficiently to degrade battery life and/or prevent engine starting.**
- **Accessories that draw higher power (i.e., coolers, vacuum cleaners, lights, etc.), will discharge the battery even more quickly. Only use these intermittently and with greater caution.**
- **After the use of high power draw accessories, or long periods of the vehicle not being started (with accessories still plugged in), the vehicle must be driven a sufficient length of time to allow the generator to recharge the vehicle's battery.**

CIGAR LIGHTER AND ASH RECEIVER

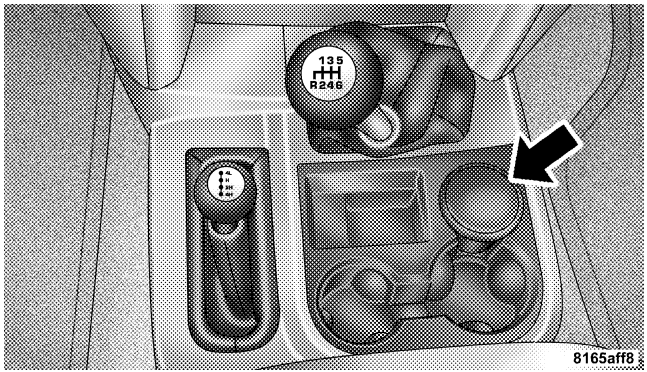
The removable ash receiver is located in the instrument panel cupholder tray.

The cigar lighter is located on the instrument panel, above and to the left of the ash receiver.

As a child safety precaution, the lighter only operates with the ignition switch ON. It heats when pushed in and pops out automatically when ready for use. **To preserve the heating element, do not hold the lighter in the heating position.**



Ash Receiver Automatic Transmission



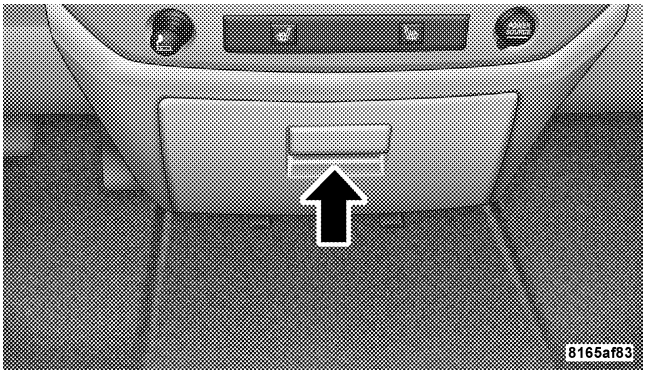
Ash Tray Manual Transmission

CUPHOLDERS

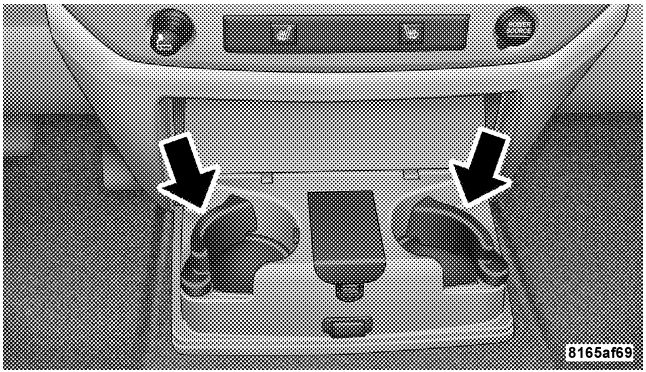
Front Instrument Panel Cupholders (40–20–40 Seats) — Automatic Transmission

Your new vehicle is equipped with two adjustable cupholders. The cupholder is opened by pulling on the cupholder door handle, on the front surface. Each opening in the cupholder is adjustable and will hold cups and mugs of various sizes.

To secure the cup, place the cup to be held into one of the cup wells and then push the cupholder arm toward the cup until it is held stable.



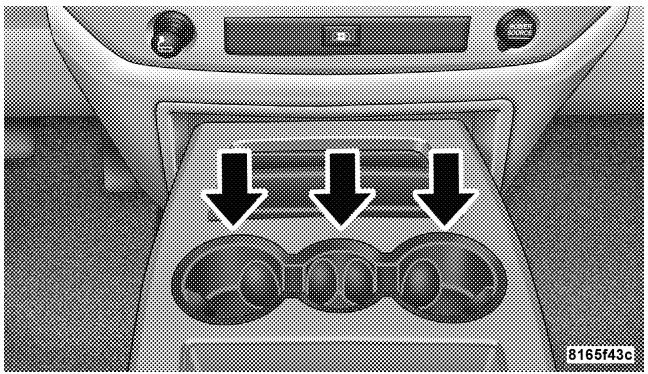
Cupholder Door Handle



Cupholders Automatic Transmission

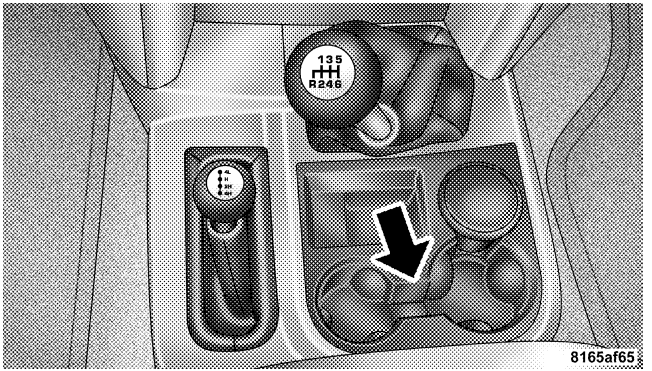
Front Instrument Panel Cupholders (Bucket Seats) — Automatic Transmission

If your new vehicle is equipped with bucket seats there are three cupholders located on the front of the center console.



Cupholders Bucket Seat

Front Instrument Panel Cupholders — Manual Transmission



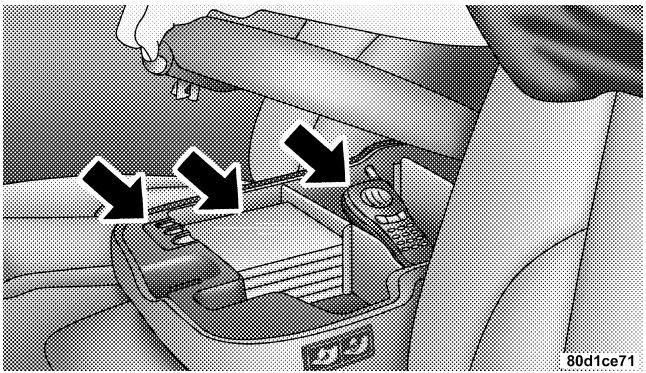
Cupholders Manual Transmission

Rear Cupholder (Quad Cab®) — If Equipped

Quad Cab® vehicles may be equipped with a rear cupholder that consists of two cupwells for rear passenger convenience.

STORAGE

Center Storage Compartment (40–20–40 Seat) — If Equipped



Center Storage Compartment

The center portion of the seat folds down to provide an armrest with unique storage compartments under the lid. Push the button on the front of the armrest to raise the cover. Inside there is a power outlet (if equipped), removable coin holder (if equipped), and two dividers to configure the storage area into compartments. For example, compartments can be configured to hold a lap-top computer, a cellular telephone, CDs and miscellaneous items. The top of the cover provides a generous firm surface to serve as a desktop for your "mobile office."

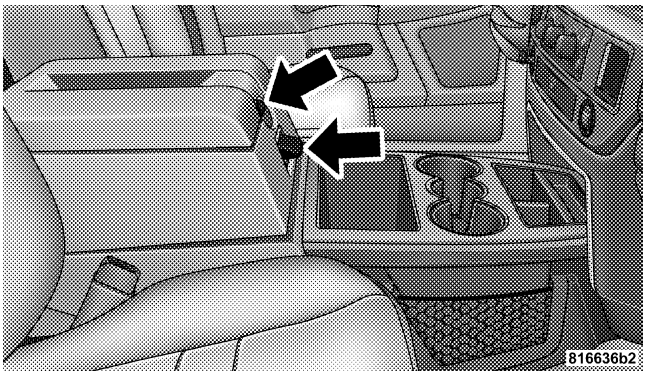
WARNING!

- **This armrest is not a seat. Anyone seated on the armrest could be seriously injured during vehicle operation, or an accident. Only use the center seating position when the armrest is fully upright.**
- **In an accident, the latch may open if the total weight of the items stored exceeds about 10 lbs (4.5 kg). These items could be thrown about endangering occupants of the vehicle. Items stored should not exceed a total of 10 lbs (4.5 kg).**

CAUTION!

- **Many accessories that can be plugged in draw power from the vehicle's battery, even when not in use (i.e., cellular phones, etc.). Eventually, if plugged in long enough, the vehicle's battery will discharge sufficiently to degrade battery life and/or prevent engine starting.**
- **Accessories that draw higher power (i.e. coolers, vacuum cleaners, lights, etc.), will degrade the battery even more quickly. Only use these intermittently and with greater caution.**
- **After the use of high power draw accessories, or long periods of the vehicle not being started (with accessories still plugged in), the vehicle must be driven a sufficient length of time to allow the generator to recharge the vehicle's battery.**

Center Storage Compartment (Bucket Seats) — If Equipped



Center Storage Compartment

Push the upper button on the front of the armrest to raise the upper cover. Inside is a power outlet (if equipped), a cut out for a cell phone charger cord, removable coin holder (if equipped), and a divider to configure the

storage area into separate compartments. Lift the lower handle on the front of the armrest, and raise the armrest for access to the lower storage bin. On Quad Cab® models the rear of the floor console offers a power outlet, and a tip out bin.

WARNING!

- **This armrest is not a seat. Anyone seated on the armrest could be seriously injured during vehicle operation, or an accident. Only use the center seating position when the armrest is fully upright.**
- **In an accident, the latch may open if the total weight of the items stored exceeds about 10 lbs (4.5 kg). These items could be thrown about endangering occupants of the vehicle. Items stored should not exceed a total of 10 lbs (4.5 kg).**

CAUTION!

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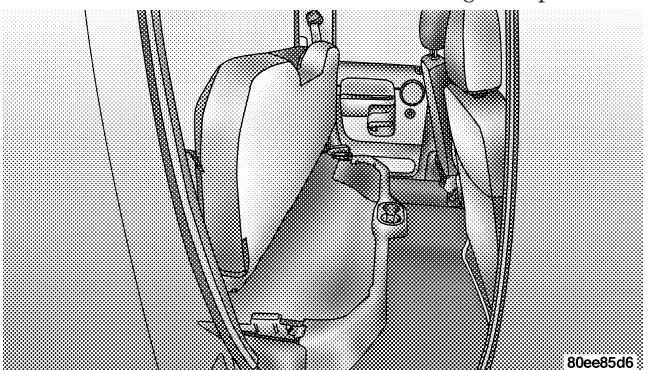
- **Accessories that draw higher power (i.e. coolers, vacuum cleaners, lights, etc.), will degrade the battery even more quickly. Only use these intermittently and with greater caution.**
- **After the use of high power draw accessories, or long periods of the vehicle not being started (with accessories still plugged in), the vehicle must be driven a sufficient length of time to allow the generator to recharge the vehicle's battery.**

Storage and Seats (Quad Cab® Models)

Located in the center of the front 40–20–40 seat cushion there is a storage compartment.

Regular Cab models also have storage behind the seat.

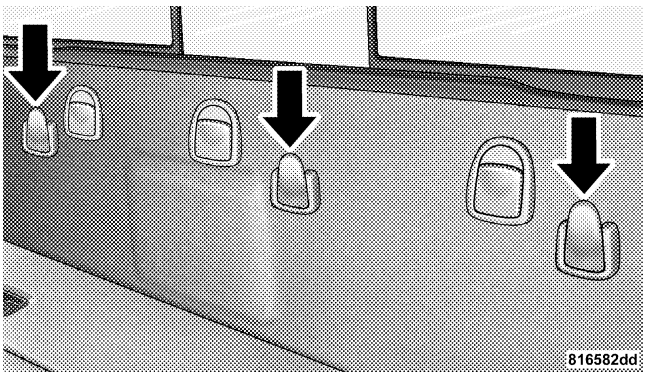
The Quad Cab® models provide additional storage under the rear seat. Lift the seat to access the storage compartment.



Quad Cab® Storage

Plastic Grocery Bag Retainers

Retainer hooks which will hold plastic grocery bag handles are built into the back panel of the cab, behind the rear seat.



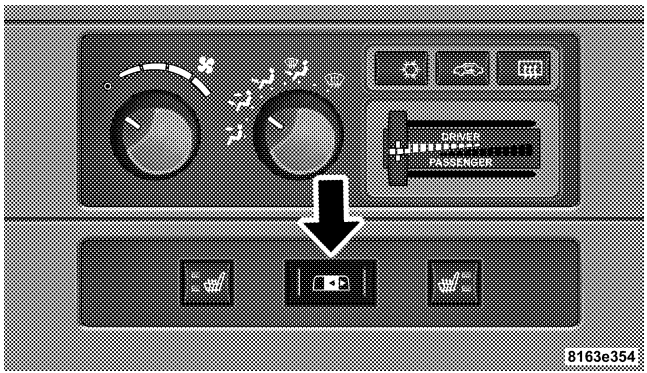
Grocery Bag Hooks

REAR WINDOW FEATURES

Electric Rear Window Defroster and Heated Sideview Mirrors — If Equipped

The Electric Rear Window Defroster and Heated Sideview Mirrors are activated by pressing the heated grid button, located on the Climate Control panel, with the ignition ON. Turning OFF the ignition will deactivate the Electric Rear Window Defroster and Heated Sideview Mirrors feature. These features also turn off after activation, when 15 minutes have elapsed. For ten more minutes of operation, push the button again.

Power Sliding Rear Window — If Equipped



Power Sliding Rear Window Switch

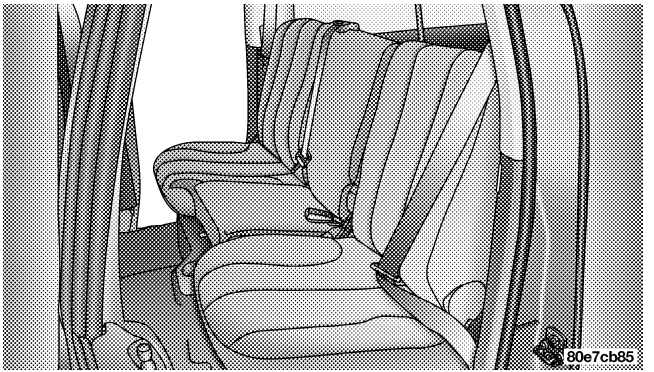
The power sliding rear window switch is located on the instrument panel below the climate controls. Press the right side of the switch to open the glass and the left side of the switch to close the glass.

Sliding Rear Window — If Equipped

A locking device in the center of the window helps to prevent entry from the rear of the vehicle. Squeeze the lock to release the window.

FOLD FLAT LOAD FLOOR — IF EQUIPPED

Quad Cab® models with a 60/40 rear seat may be equipped with a folding load floor.



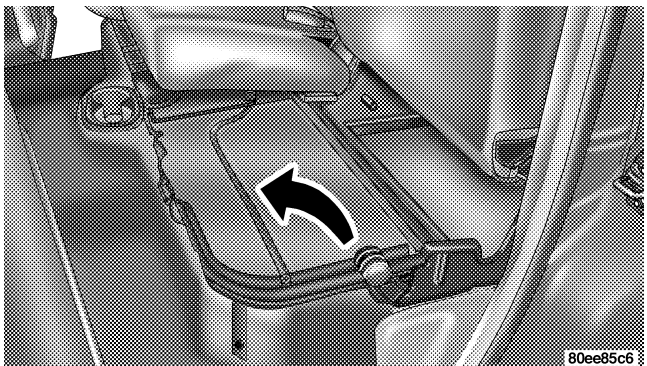
Quad Cab® Rear 60/40 Seat

WARNING!

Do not operate the vehicle with loose items stored on the load floor. While driving or in an accident you may experience abrupt stopping, rapid acceleration, or sharp turns. Loose objects stored on the load floor may move around with force and strike occupants, resulting in serious or fatal injury.

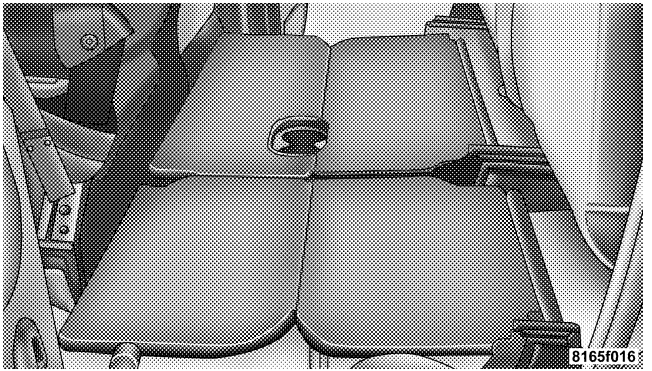
Unfolding the Load Floor

1. Lift the 60/40 seat cushion(s) to the upward position.



Unfolding The Load Floor

2. Grasp the knob on the load floor and lift the knob until the load floor unfolds into position.



Load Floor In Open Position

3. Reverse the procedure to store the load floor.

Positioning the Load Floor for Storage Access Under the Seat

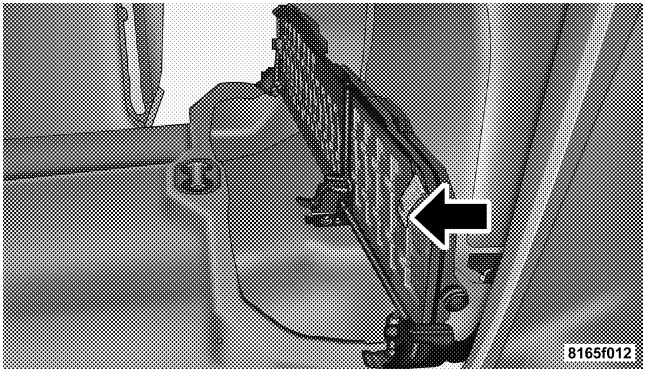
1. Lift the 60/40 seat cushion(s) to the upward position.

2. Unsnap the securing snap located at either side of the load floor.

3. Lift the load floor up to access storage under the load floor.

WARNING!

Do not drive with the load floor in the up position. When stopping fast or in an accident, the load floor could move to the down position causing serious injury.



Load Floor Securing Straps

4. Reverse the procedure to put the load floor back in the secured down position before you operate the vehicle.

UNDERSTANDING YOUR INSTRUMENT PANEL

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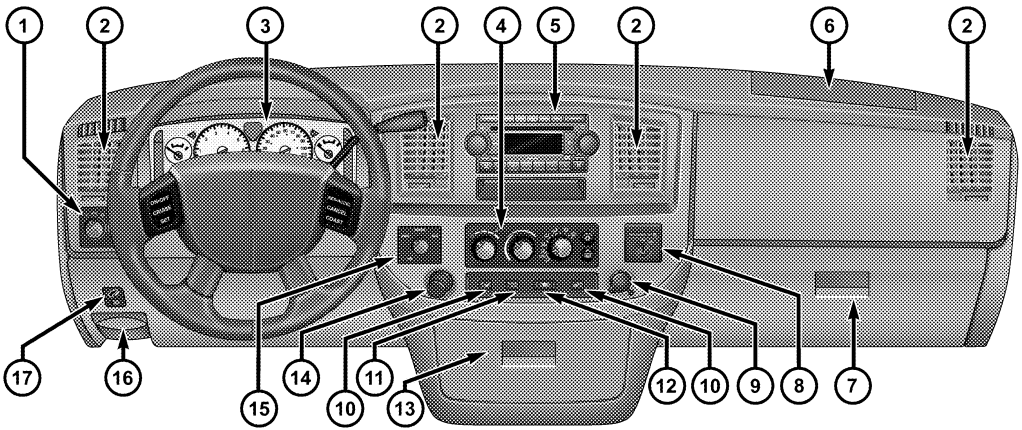
INSTRUMENTS AND CONTROLS



1. Headlight Switch
2. Air Outlets
3. Instrument Cluster
4. Climate Controls
5. Radio
6. Passenger Airbag*
7. Glove Box
8. Passenger Airbag On/Off Switch*
9. Power Outlet
10. Heated Seat Switch
11. Exhaust Brake Switch*
12. Power Sliding Back Glass*
13. Cup Holders
14. Cigar Lighter
15. Transfer Case Control Switch*
16. Parking Brake Release Lever
17. Adjustable Pedal Control Switch*

*If Equipped

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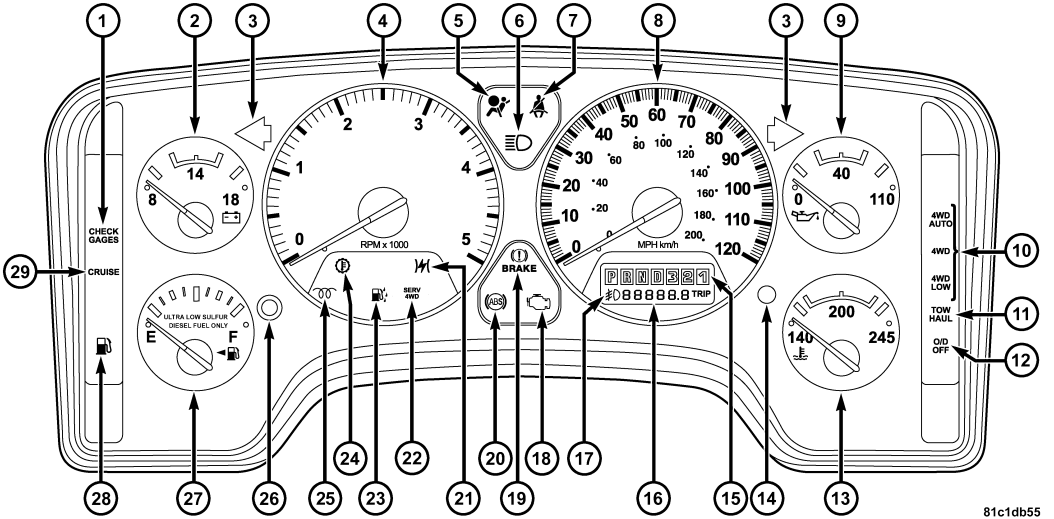
INSTRUMENT CLUSTERS

6.7L Cummins Diesel Engines



INSTRUMENT CLUSTER DESCRIPTION

1. Check Gauges

CHECK GAGES This light illuminates when the Voltmeter, Engine Oil Pressure or Engine Coolant Temperature gauges indicate a reading either too high or too low. Examine the gauges carefully, and follow the instructions contained below for each indicated problem.

NOTE: When the ignition switch is turned to OFF, the Fuel Gauge, Voltmeter, Oil Pressure and Engine Coolant Temperature gauges may not show accurate readings. When the engine is not running, turn the ignition switch to ON to obtain accurate readings.

2. Voltmeter

When the engine is running, the gauge indicates the electrical system voltage. The pointer should stay within the normal range if the battery is charged. If the pointer moves to either extreme left or right and remains there during normal driving, the electrical system should be serviced.

NOTE: If the gauge pointer moves to either extreme of the gauge, the "Check Gauges" indicator will illuminate and a single chime will sound.

NOTE:

- The voltmeter may show a gauge fluctuation at various engine temperatures. This cycling operation is caused by the post-heat cycle of the intake manifold heater system. The number of cycles and the length of the cycling operation is controlled by the engine control module. Post-heat operation can run for several minutes, and then the electrical system and voltmeter needle will stabilize.
- The cycling action will cause temporary dimming of the headlights, interior lights, and also a noticeable reduction in blower motor speed.

3. Turn Signal Indicators
Lights in instrument cluster flash when outside turn signals are operating.

4. Tachometer
The tachometer indicates engine speed in revolutions per minute.

CAUTION!
Do not operate the engine with the tachometer pointer at high rpm for extended periods. Engine damage may occur.

5. Airbag Indicator Light
The indicator lights and remains lit for six to eight seconds when the ignition is first turned on. If the light stays on, flickers or comes on while driving, have the airbag system checked by an authorized dealer.

6. High Beam Indicator

This indicator shows that headlights are on high beam.

7. Seat Belt Reminder Light

When the ignition switch is first turned ON, this light will turn on for five to eight seconds as a bulb check. During the bulb check, if the driver's seat belt is unbuckled, a chime will sound. After the bulb check or when driving, if the driver seat belt remains unbuckled, the Seat Belt Warning Light will flash or remain on continuously. Refer to "Enhanced Driver Seat Belt Reminder System (BeltAlert®)" under "Occupant Restraints" in section 2.

8. Speedometer
The speedometer shows the vehicle speed in miles per hour and/or kilometers per hour.

9. Oil Pressure Gauge

The pointer should always indicate some oil pressure when the engine is running. A continuous high or low reading, under normal driving conditions, may indicate a lubrication system malfunction. Immediate service should be obtained.(See page 384 for more information.)

NOTE: If the gauge pointer moves to either extreme of the gauge, the "Check Gauges" indicator will illuminate and a single chime will sound.

10. Transfer Case Position

(See page 278 for more information.)

11. **TOW HAUL**

The TOW HAUL button is located at the end of the gear shift lever. This light will illuminate when the TOW HAUL OD/OFF button is pushed once.(See page 272 for more information.)

12. **OD/OFF**

The OD/OFF button is located at the end of the gear shift lever. This light will illuminate when the TOW HAUL OD/OFF button is pushed twice.(See page 272 for more information.)

13. Temperature Gauge

The temperature gauge indicates engine coolant temperature. Any reading within the normal range indicates that the cooling system is operating satisfactorily. The gauge needle will likely indicate a higher temperature when driving in hot weather, up mountain grades, in heavy traffic, or when towing a trailer. If the needle rises to the "245°F" (118°C) mark, stop the vehicle, shift into NEUTRAL, and increase the engine idle speed for two to three minutes. If the temperature reading does not return to normal, shut your engine OFF and allow it to cool. Seek authorized service immediately. Refer to "Cooling System" under "Maintaining Your Vehicle" in Section 7.

CAUTION!

Do not leave your vehicle unattended with the engine running as you would not be able to react to the temperature indicator if the engine overheats.

NOTE: Engine idle speed will automatically increase to 1000 rpm at elevated coolant temperatures to improve engine cooling.

NOTE: If the gauge pointer moves to either extreme of the gauge, the "Check Gauges" indicator will illuminate and a single chime will sound.

14. Security Light

The light will flash rapidly for approximately 16 seconds when the Vehicle Theft Alarm is arming. The light will flash at a slower rate after the alarm is set. The Security Light will also come on for about two seconds when the ignition is first turned ON.

15. Transmission Range Indicator (Automatic Transmissions Only)

When the gear selector lever is moved, this indicator shows the automatic transmission gear range selected.

16. Odometer/Trip Odometer

The odometer shows the total distance the vehicle has been driven. U.S. federal regulations require that upon transfer of vehicle ownership, the seller certify to the purchaser the correct mileage that the vehicle has been driven. Therefore, if the odometer reading is changed during repair or replacement, be sure to keep a record of the reading before and after the service so that the correct mileage can be determined.

The two trip odometers show individual trip mileage. To switch from odometer to trip odometers, press and release the Trip Odometer button.

To reset a trip odometer, display the desired trip odometer to be reset then push and hold the button until the display resets (approximately two seconds).

Vehicle Warning Messages

For non–Electronic Vehicle Information Center (EVIC) equipped vehicles, and the appropriate conditions exist, messages such as "door" (indicates that a door(s) may be ajar), "hood" (if the hood is open or ajar, on vehicles with remote start), "gASCAP" (which indicates that your gas cap is possibly loose or damaged), "CHANgE OIL" (indicates that the engine oil should be changed), "Lo-WASH" (low washer fluid), and "noFUSE" (indicates that the IOD fuse is removed from the Integrated Power Module), will display in the odometer.

NOTE: If the vehicle is equipped with an EVIC, most warnings will display in the EVIC. For additional information, refer to "System Status (EVIC Displays)" under "Overhead Console With Electronic Vehicle Information Center (EVIC) — Diesel Only" in Section 3.

NOTE: There is also an engine hour function. This indicates the total number of hours the engine has been running. To display the engine hours perform the following: Place the ignition in RUN, but do not start the engine. With the odometer value displayed, hold the trip button down for a period of six seconds. The odometer will change to trip value first, then it will display the engine hour value. The engine hours will be displayed for a period of 30 seconds until the ignition is turned off or the engine is started.

Change Oil Message

Your vehicle is equipped with an engine oil change indicator system. The "Change Oil" message will flash in the instrument cluster odometer for approximately 12 seconds after a single chime has sounded to indicate the next scheduled oil change interval. The engine oil change indicator system is duty cycle based, which means the engine oil change interval may fluctuate dependent upon your personal driving style.

Unless reset, this message will continue to display each time you turn the ignition switch to the ON/RUN position. To turn off the message temporarily, press and release the Trip Odometer button on the instrument cluster. To reset the oil change indicator system (after performing the scheduled maintenance) refer to the following procedure.

1. Turn the ignition switch to the ON position. **(Do not start the engine.)**
2. Fully depress the accelerator pedal slowly three times within 10 seconds.
3. Turn the ignition switch to the OFF/LOCK position.

NOTE: If the indicator message illuminates when you start the vehicle, the oil change indicator system did not reset. If necessary repeat this procedure.

17. Front Fog Light Indicator — If Equipped

This light shows when the front fog lights are ON.

18. Malfunction Indicator Light (MIL)

This light is part of an onboard diagnostic system which monitors the emissions and engine control system. If the vehicle is ready for emissions testing the light will come on when the ignition is first turned on and remain on, as a bulb check, until the engine is started. If the vehicle is not ready for emissions testing the light will come on when the ignition is first

turned on and remain on for 15 seconds, then blink for five seconds, and remain on until the vehicle is started. If the bulb does not come on during starting, have the condition investigated promptly.

If this light comes on and remains on while driving, it suggests a potential engine control problem and the need for system service.

Although your vehicle will usually be drivable and not need towing, see your authorized dealer for service as soon as possible.

CAUTION!

Prolonged driving with the MIL on could cause damage to the engine control system. It also could affect fuel economy and drivability.

If the MIL is flashing, severe catalytic converter damage and power loss will soon occur. Immediate service is required.

19. Brake System Warning Light

This light illuminates when the ignition key is turned to the ON position and remains on for a few seconds. If the light stays on longer, it may be an indication that the parking brake has not been released. This light will illuminate if the brake fluid is low, especially when braking or accelerating hard. This light will illuminate if the ABS indicator light has a malfunction. This light will flash if the engine is running and the parking brake is on.

If the light remains on when the parking brake is released, it indicates a possible brake hydraulic system malfunction. In this case, the light will remain on until the cause is corrected.

If brake failure is indicated, immediate repair is necessary and continued operation of the vehicle in this condition is dangerous.

Acceleration which causes the rear wheels to slip for a period of time may result in the red brake light illuminating and a brake switch code being set on ABS equipped vehicles. Depressing the brake pedal should extinguish the red brake light.

20. ABS Warning Light (ABS)

This light monitors the Anti-Lock Brake System which is described elsewhere in this manual. This light will come on when the ignition key is turned to the ON position and may stay on for five seconds. If the ABS light remains on or comes on during driving, it indicates that the anti-lock portion of the brake system is not functioning and that service is required. See your authorized dealer immediately. The ABS light could also illuminate during loss of traction and remain illuminated until the brake pedal is pressed.

21. Electronic Throttle Control (ETC)

This light informs you of a problem with the Electronic Throttle Control system. If a problem is detected, the light will come on while the engine is running. If the light remains lit with the engine running your vehicle will usually be drivable, however, see your authorized dealer for service as soon as possible. If the light is flashing when the engine is running, immediate service is required and you may experience reduced performance, an elevated/rough idle or engine stall and your vehicle may require towing. The light will come on when the ignition is first turned on

and remain on for 15 seconds as a bulb check. If the light does not come on during starting, have the system checked by an authorized dealer.

22. SERV 4WD Indicator

The 4WD indicator will be illuminated whenever the 4WD mode is engaged for either the manual or electric shift 4WD systems. The SERV 4WD indicator monitors the electric shift 4WD system. If the SERV 4WD light stays on or comes on during driving, it means that the 4WD system is not functioning properly and that service is required.

23. Water In Fuel Indicator — Diesel Engines

Indicates there is water detected in the fuel filter. Refer to the Maintenance section, Draining Fuel/ Water Separator Filter, for water drain procedure.(See page 393 for more information.)

24. Transmission Oil Temperature Warning Light (Automatic Transmissions Only)

This light indicates that there is excessive transmission fluid temperature that might occur with severe usage such as trailer towing. It may also occur when operating the vehicle in a high torque converter slip condition, such as 4-wheel drive operation (e.g., snow plowing, off-road operation). If this light comes on, stop the vehicle and run the engine at idle or faster, with the transmission in NEUTRAL until the light goes off.

25. Wait To Start Indicator — Diesel Only

The Wait To Start indicator will illuminate when the ignition is turned to the run position and the intake manifold temperature is below 66°F (19°C). Follow engine starting procedure for proper engine starting and operating. Wait until the Wait To Start indicator turns OFF, then start the vehicle.

NOTE: The Wait To Start Indicator may not illuminate if the engine coolant temperature is warm enough.

26. Odometer/Trip Odometer Button
Press this button to toggle between the odometer and the trip odometer display. Holding the button in resets the trip odometer reading when in trip mode.

27. Fuel Gauge
Shows level of fuel in tank when ignition switch is in the ON position.

28. Low Fuel Warning Light

Glows when the pointer is between "E" and 1/8 indication mark (approximately 15% of tank volume) on the fuel gauge. When the fuel gauge pointer is on "E" (equivalent to Distance To Empty [DTE] = 0 on the overhead console, if so equipped) there is reserve fuel capacity, which corresponds to approximately 8% of tank volume. This reserve capacity was put in place to prevent the likelihood of customers running out of fuel when operating at maximum load conditions in areas where there aren't many fuel stations. (See page 139 for more information.)

Fuel tank volumes are as follows:

- 52 gal (197 L) - Standard Rear Tank
- 22 gal (83 L) - Optional Mid Ship Tank

29. CRUISE Light
This indicator lights when the electronic speed control system is turned on.

ELECTRONIC DIGITAL CLOCK

The clock and radio each use the display panel built into the radio. A digital readout shows the frequency and/or time in hours and minutes (depending on your radio model) whenever the ignition switch is in the ON or ACC position.

When the ignition switch is in the OFF position, or when the radio frequency is being displayed, time keeping is accurately maintained.

On the AM/FM/CD (6–disc) RAQ radio (sales code 746–112), the time button alternates the location of the time and frequency on the display. On the AM/FM/CD (single disc) REF radio (sales code 746–110), only one of the two, time or frequency, is displayed at a time.

Clock Setting Procedure

1. Press and hold the time button until the hours blink.
2. Adjust the hours by turning the right side Tune/Audio control.
3. After the hours are adjusted, press the right side Tune/Audio control to set the minutes.
4. Adjust the minutes using the right side Tune/Audio control.
5. To exit, press any button/knob or wait approximately five seconds.

RADIO GENERAL INFORMATION

RADIO BROADCAST SIGNALS

The radio will provide excellent reception under most operating conditions. Like any system, however, automotive radios have performance limitations, due to mobile operation and natural phenomena, which might lead you to believe your sound system is malfunctioning. To help you understand and save you concern about these "apparent" malfunctions, you must understand a point or two about the transmission and reception of radio signals.

Electrical Disturbances

Radio waves may pick up electrical disturbances during transmission. They mainly affect the wave amplitude, and thus remain a part of the AM reception. They interfere very little with the frequency variations that carry the FM signal.

TWO TYPES OF SIGNALS

There are two basic types of radio signals: AM or Amplitude Modulation, in which the transmitted sound causes the amplitude, or height, of the radio waves to vary; and FM or Frequency Modulation, in which the frequency of the wave is varied to carry the sound.

AM Reception

AM sound is based on wave amplitude, so AM reception can be disrupted by such things as lightning, power lines and neon signs.

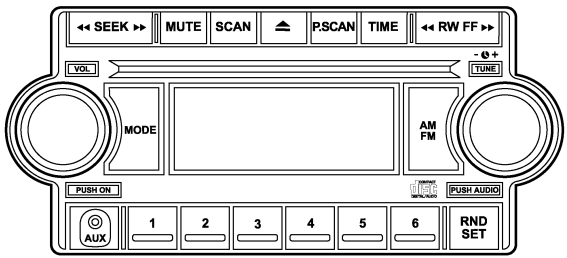
FM Reception

Because FM transmission is based on frequency variations, interference that consists of amplitude variations can be filtered out, leaving the reception relatively clear, which is the major feature of FM radio.

NOTE: The radio, steering wheel radio controls (if equipped), and six-disc CD/DVD changer (if equipped) will remain active for up to 10 minutes after the ignition switch has been turned OFF. Opening a vehicle front door will cancel this feature.

SALES CODE 746–110 (REF) — AM/FM/CD (SINGLE DISC) RADIO WITH OPTIONAL SATELLITE RADIO AND HANDS FREE PHONE CAPABILITY

NOTE: The radio sales code is located on the lower right side of your radio faceplate.



REF Radio

Operating Instructions - Radio Mode

NOTE: The ignition switch must be in the ON or ACC position to operate the radio.

Power Switch/Volume Control (Rotary)
Press the ON/VOL control to turn the radio ON. Press the ON/VOL a second time to turn OFF the radio.

Electronic Volume Control
The electronic volume control turns continuously (360 degrees) in either direction without stopping. Turning the volume control to the right increases the volume and to the left decreases it.

When the audio system is turned on, the sound will be set at the same volume level as last played.

For your convenience, the volume can be turned down, but not up, when the audio system is off and the ignition is ON.

Mode Button (Radio Mode)
Press the MODE button repeatedly to select between the CD player and Satellite Radio (if equipped).

SEEK Button (Radio Mode)
Press and release the SEEK button to search for the next listenable station in either AM/FM or Satellite (if equipped) mode. Press the right side of the button to seek up and the left side to seek down. The radio will remain tuned to the new station until you make another selection. Holding the button will bypass stations without stopping until you release it.

MUTE Button (Radio Mode)
Press the MUTE button to cancel the sound from the speakers. MUTE will display. Press the MUTE button a second time and the sound from the speakers will return. Rotating the volume control, turning the radio ON/OFF, or turning ON/OFF the ignition, will cancel the MUTE feature.

NOTE: In Hands-Free Phone (if equipped) mode, the MUTE button mutes the microphone.

SCAN Button (Radio Mode)
Pressing the SCAN button causes the tuner to search for the next listenable station in either, AM, FM, or Satellite (if equipped) frequencies, pausing for five seconds at each listenable station before continuing to the next. To stop the search, press SCAN a second time.

PSCAN Button (Radio Mode)
Pressing the PSCAN button causes the tuner to scan through preset stations in either, AM, FM, or Satellite (if equipped) frequencies, pausing for five seconds at each preset station before continuing to the next. To stop the search, press PSCAN a second time.

TIME Button
Press the TIME button and the time of day will display for five seconds.

Clock Setting Procedure

1. Press and hold the TIME button until the hours blink.
2. Adjust the hours by turning the TUNE/AUDIO control.
3. After the hours are adjusted, press the TUNE/AUDIO control to set the minutes. The minutes will begin to blink.
4. Adjust the minutes using the TUNE/AUDIO control.
5. To exit, press any button/knob or wait five seconds.

RW/FF (Radio Mode)
Pressing the Rewind/Fast Forward button causes the tuner to search for the next frequency in the direction of the arrows. This feature operates in either AM, FM or Satellite (if equipped) frequencies.

TUNE Control (Radio Mode)
Turn the rotary TUNE control clockwise to increase or counterclockwise to decrease the frequency.

AM/FM Button (Radio Mode)
Press the button to select AM or FM modes.

Setting the Tone, Balance, and Fade
Press the rotary TUNE control, and BASS will display. Turn the TUNE control to the right or left to increase or decrease the Bass tones.

Press the rotary TUNE control a second time and MID will display. Turn the TUNE control to the right or left to increase or decrease the Mid-Range tones.

Press the rotary TUNE control a third time and TREB will display. Turn the TUNE control to the right or left to increase or decrease the Treble tones.

Press the rotary TUNE control a fourth time and BAL will display. Turn the TUNE control to the right or left to adjust the sound level from the right or left side speakers.

Press the rotary TUNE control a fifth time and FADE will display. Turn the TUNE control to the left or right to adjust the sound level between the front and rear speakers.

Press the tune control again or wait five seconds to exit setting tone, balance, and fade.

RND/SET Button (Radio Mode) To Set The Pushbutton Memory
When you are receiving a station that you wish to commit to pushbutton memory, press the SET button. The symbol SET 1 will now show in the display window. Select the button (1-6) you wish to lock onto this station and press and release that button. If a button is not

selected within five seconds after pressing the SET button, the station will continue to play but will not be stored into pushbutton memory.

You may add a second station to each pushbutton by repeating the above procedure with this exception: Press the SET button twice and SET 2 will show in the display window. Each button can be set for SET 1 and SET 2 in both AM and FM. This allows a total of 12 AM, 12 FM, and 12 Satellite (if equipped) stations to be stored into pushbutton memory. The stations stored in SET 2 memory can be selected by pressing the pushbutton twice.

Every time a preset button is used, a corresponding button number will display.

Preset Buttons 1 - 6 (Radio Mode)
These buttons tune the Radio to the stations that you commit to pushbutton memory, 12 AM, 12 FM, and 12 Satellite (if equipped) stations.

Operating Instructions - CD Mode

NOTE: The ignition switch must be in the ON or ACC position to operate the radio.

Inserting The Compact Disc (Single CD Player)
Gently insert one CD into the CD player with the CD label facing up. The CD will automatically be pulled into the CD Player and the CD icon will illuminate on the radio display.

If the volume control is ON, the unit will switch to CD mode and begin to play. The display will show the track number and play time in minutes and seconds. Play will begin at the start of track one.

NOTE:
- On some vehicles, you may insert or eject a disc with the radio or ignition switch OFF.

- If you insert a disc with the ignition ON and the radio OFF, the CD will automatically be pulled into the CD player.
- This radio does not play discs with MP3 tracks.

SEEK Button (CD Mode)
Press the right side of the SEEK button for the next track on the CD. Press the left side of the button to return to the beginning of the current track, or return to the beginning of the previous track if the CD is within the first 10 seconds of the current selection.

MUTE Button (CD Mode)
Press the MUTE button to cancel the sound from the speakers. "MUTE" will display. Press the MUTE button a second time and the sound from the speakers will return. Rotating the volume control or turning OFF the ignition will also return the sound from the speakers.

SCAN Button (CD Mode)
Press this button to play the first 10 seconds of each track. To stop the scan function, press the button a second time.

EJECT Button (CD Mode)

Press this button and the disc will unload and move to the entrance for easy removal. The unit will switch to the last selected mode.

If you do not remove the disc within 15 seconds, it will be reloaded. The radio mode will continue to appear.

TIME Button (CD Mode)
Press this button to change the display from elapsed CD playing time to time of day. The time of day will display for five seconds.

RW/FF (CD Mode)
Press and hold the FF (Fast Forward) and the CD player will begin to fast forward until FF is released. The RW (Reverse) button works in a similar manner.

Press and hold the FF button to fast forward through the tracks. Release the FF button to stop the fast forward feature. If the RW button is pressed, the current track will reverse to the beginning of the track and begin playing.

RND/SET Button (Random Play Button) (CD Mode)
Press this button while the CD is playing to activate Random play. This feature plays the selections on the compact disc in random order to provide an interesting change of pace.

Press the SEEK button to move to the next randomly selected track.

Press the RND button a second time to stop Random play.

Operating Instructions - Auxiliary Mode

The auxiliary (AUX) jack is an audio input jack, which allows the user to plug in a portable device such as an MP3 player, cassette player, or microphone and utilize the vehicle's audio system to amplify the source and play through the vehicle speakers.

The auxiliary mode becomes active when an electrical device is plugged into the AUX jack using a standard 3.5 mm stereo audio cable and the user presses and releases the MODE button until AUX appears on the display.

NOTE: The radio will return to the last stored mode if the ignition switch is turned from the OFF/LOCK position to the ACC position, the radio is turned on, and the radio was previously in the AUX mode.

SEEK Button (Auxiliary Mode)
No function.

MUTE Button (Auxiliary Mode)
Press the MUTE button to cancel the sound from the speakers. ″MUTE″ will display. Press the MUTE button a second time and the sound from the speakers will return. Rotating the volume control or turning off the ignition will also return the sound from the speakers.

SCAN Button (Auxiliary Mode)
No function.

EJECT Button (Auxiliary Mode)
No function.

PSCAN Button (Auxiliary Mode)
No function.

TIME Button (Auxiliary Mode)
Press this button to change the display from elapsed playing time to time of day. The time of day will display for five seconds.

RW/FF (Auxiliary Mode)
No function.

RND/SET Button (Auxiliary Mode)
No function.

Mode Button (Auxiliary Mode)
Press the MODE button repeatedly to select between the CD player and Satellite Radio (if equipped).

Operating Instructions - Hands-Free Phone — If Equipped

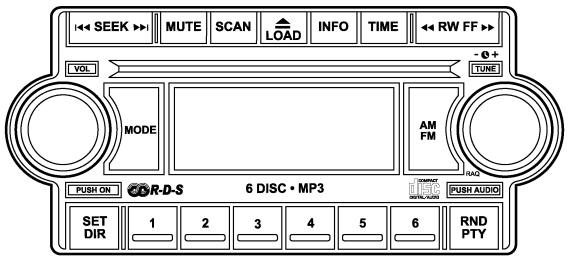
Refer to the "Hands-Free Phone (UConnect®)" section of this Owner's Manual.

Operating Instructions - Satellite Radio — If Equipped

Refer to the "Satellite Radio" section of this Owner's Manual.

SALES CODE 746–112 (RAQ) – AM/FM/CD (6-DISC) RADIO WITH OPTIONAL SATELLITE RADIO, AND HANDS-FREE PHONE

NOTE: The radio sales code is located on the lower right side of your radio faceplate.



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RAQ Radio

Operating Instructions - Radio Mode

NOTE: The ignition switch must be in the ON or ACC position to operate the radio.

Power Switch/Volume Control (Rotary)
Press the ON/VOL control to turn the radio ON. Press the ON/VOL a second time to turn off the radio.

Electronic Volume Control
The electronic volume control turns continuously (360 degrees) in either direction without stopping. Turning the volume control to the right increases the volume and to the left decreases it.

When the audio system is turned on, the sound will be set at the same volume level as last played.

For your convenience, the volume can be turned down, but not up, when the audio system is off and the ignition is ON.

Mode Button (Radio Mode)
Press the MODE button to select between the CD player or Satellite Radio.

SEEK Button (Radio Mode)
Press and release the SEEK button to search for the next listenable station in either AM/FM or Satellite (if equipped) mode. Press the right side of the button to seek up and the left side to seek down. The radio will remain tuned to the new station until you make another selection. Holding the button will bypass stations without stopping until you release it.

MUTE Button (Radio Mode)
Press the MUTE button to cancel the sound from the speakers. ″MUTE″ will be displayed. Press the MUTE button a second time and the sound from the speakers will return. Rotating the volume control, turning the radio ON/OFF, or turning OFF the ignition will also return the sound from the speakers

NOTE: In Hands-Free Phone (if equipped) mode, the MUTE button mutes the microphone.

SCAN Button (Radio Mode)
Pressing the SCAN button causes the tuner to search for the next listenable station, in either AM, FM or Satellite (if equipped) frequencies, pausing for five seconds at each listenable station before continuing to the next. To stop the search, press SCAN a second time.

MSG or INFO Button (Radio Mode)
Press the MSG or INFO button for an RBDS station (one with call letters displayed). The radio will return a Radio Text message broadcast from an FM station (FM mode only).

TIME Button
Press the TIME button and the time of day will be displayed for five seconds.

Clock Setting Procedure

1. Press and hold the time button until the hours blink.
2. Adjust the hours by turning the TUNE/AUDIO control.
3. After the hours are adjusted, press the TUNE/AUDIO control to set the minutes. The minutes will begin to blink.
4. Adjust the minutes by turning the TUNE/AUDIO control.
5. To exit, press any button/knob or wait five seconds.

RW/FF (Radio Mode)
Pressing the Rewind/Fast Forward button causes the tuner to search for the next frequency in the direction of the arrows. This feature operates in either AM, FM or Satellite (if equipped) frequencies.

TUNE Control (Radio Mode)
Turn the rotary TUNE control clockwise to increase or counterclockwise to decrease the frequency.

AM/FM Button (Radio Mode)
Press the button to select AM or FM Modes.

Setting the Tone, Balance, and Fade
Press the rotary TUNE control, and BASS will display. Turn the TUNE control to the right or left to increase or decrease the Bass tones.

Press the rotary TUNE control a second time and MID will display. Turn the TUNE control to the right or left to increase or decrease the Mid Range tones.

Press the rotary TUNE control a third time and TREBLE will display. Turn the TUNE control to the right or left to increase or decrease the Treble tones.

Press the rotary TUNE control a fourth time and BALANCE will display. Turn the TUNE control to the right or left to adjust the sound level from the right or left side speakers.

Press the rotary TUNE control a fifth time and FADE will display. Turn the TUNE control to the left or right to adjust the sound level between the front and rear speakers.

Press the rotary TUNE control again to exit setting tone, balance and fade.

RND/PTY Button (Radio Mode)
Pressing this button once will turn on the PTY mode for five seconds. If no action is taken during the five second time out the PTY icon will turn off. Pressing the PTY button or turning the TUNE rotary knob within five seconds will allow the program format type to be selected. Many radio stations do not currently broadcast PTY information.

Toggle the PTY button to select the following format types:

Program Type	16 Digit-Character Display
No program type or undefined	None
Adult Hits	Adult_Hits
Alert Alert	Alert Alert
Classical	Classical
Classic Rock	Classic_Rock
College	College
Country	Country
Emergency Test	Emergency Test
Foreign Language	Foreign_Language
Information	Information
Jazz	Jazz
News	News
Nostalgia	Nostalgia
Oldies	Oldies
Personality	Personality
Public	Public
Rhythm and Blues	Rhythm_and_Blues
Religious Music	Religious_Music
Religious Talk	Religious_Talk
Rock	Rock
Soft	Soft
Soft Rock	Soft_Rock
Soft Rhythm and Blues	Soft_R_&_B
Sports	Sports
Talk	Talk
Top 40	Top_40
Weather	Weather

By pressing the SEEK button when the PTY icon is displayed, the radio will be tuned to the next frequency station with the same selected PTY name. The PTY function only operates when in the FM mode.

If a preset button is activated while in the PTY (Program Type) mode, the PTY mode will be exited and the radio will tune to the preset station.

SET/DIR Button (Radio Mode) — To Set the Pushbutton Memory

When you are receiving a station that you wish to commit to pushbutton memory, press the SET/DIR button. The symbol SET 1 will now show in the display window. Select the button (1-6) you wish to lock onto this station and press and release that button. If a button is not selected within five seconds after pressing the SET/DIR button, the station will continue to play but will not be stored into pushbutton memory.

You may add a second station to each pushbutton by repeating the above procedure with this exception: Press the SET/DIR button twice and SET 2 will show in the display window. Each button can be set for SET 1 and SET 2 in both AM and FM. This allows a total of 12 AM, 12 FM and 12 Satellite (if equipped) stations to be stored into pushbutton memory. The stations stored in SET 2 memory can be selected by pressing the pushbutton twice.

Every time a preset button is used, a corresponding button number will be displayed.

Buttons 1 - 6 (Radio Mode)

These buttons tune the Radio to the stations that you commit to pushbutton memory, 12AM, 12 FM, and 12 Satellite (if equipped) stations.

Operating Instructions - (CD Mode for CD Audio Play)

NOTE: The ignition switch must be in the ON or ACC position to operate the radio.

NOTE: This Radio is capable of playing compact discs (CD), recordable compact discs (CD-R), rewritable compact discs (CD-RW) compact discs with MP3 tracks and multisession compact discs with CD and MP3 tracks.

Inserting Compact Disc(s)
Gently insert one CD into the CD player with the CD label facing up. The CD will automatically be pulled into the CD Player and the CD icon will illuminate on the radio display.

CAUTION!

This CD player will accept 4 3/4 in (12 cm) discs only. The use of other sized discs may damage the CD player mechanism.

You may eject a disc with the radio OFF.

If you insert a disc with the ignition ON and the radio ON, the unit will switch from radio to CD mode and begin to play when you insert the disc. The display will show the disc number, the track number, and index time in minutes and seconds. Play will begin at the start of track one.

SEEK Button (CD Mode for CD Audio Play)
Press the right side of the SEEK button for the next selection on the CD. Press the left side of the button to return to the beginning of the current selection, or return to the beginning of the previous selection if the CD is within the first 10 seconds of the current selection.

MUTE Button (CD Mode for CD Audio Play)
Press the MUTE button to cancel the sound from the speakers. ″MUTE″ will be displayed. Press the MUTE button a second time and the sound from the speakers will return. Rotating the volume control, turning the radio ON/OFF, or turning OFF the ignition will also return the sound from the speakers.

SCAN Button (CD Mode for CD Audio Play)
Press the SCAN button to scan through each track on the CD currently playing.

LOAD/EJECT Button (CD Mode for CD Audio Play)

LOAD/ EJECT - Load

Press the LOAD/EJECT button and the push-button with the corresponding number where the CD is being loaded. The radio will display PLEASE WAIT and prompt when to INSERT DISC. After the radio displays ″LOAD DISC″ insert the CD into the player.

Radio display will show ″LOADING DISC″ when the disc is loading, and “READING DISC” when the radio is reading the disc.

LOAD / EJT - Eject

Press the LOAD/ EJT button and the push-button with the corresponding number where the CD was loaded and the disc will unload and move to the entrance for easy removal.

Radio display will show "EJECTING DISC" when the disc is being ejected and prompt the user to remove the disc.

Press and hold the LOAD/ EJT button for five seconds and all CDs will be ejected from the radio.

If you have ejected a disc and have not removed it within 15 seconds, it will be reloaded. If the CD is not removed, the radio will continue to play the non-removed CD. If the CD is removed and there are other CDs in the radio, the radio will play the next CD after a two minute timeout. If the CD is removed and there are no other CDs in the radio, the radio will remain in CD mode and display "INSERT DISC" for 10 seconds. If no discs are inserted within 10 seconds "NO DISCS LOADED" will be displayed.

On some vehicles a disc can be ejected with the radio and ignition OFF.

TIME Button (CD Mode for CD Audio Play)
Press this button to change the display from a large CD playing time display to a small CD playing time display.

RW/FF (CD Mode for CD Audio Play)
Press and hold FF (Fast Forward) and the CD player will begin to fast forward until FF is released or RW or another CD button is pressed. The RW (Reverse) button works in a similar manner.

Press and hold the FF button to fast forward through the tracks. Release the FF button to stop the fast forward feature.

TUNE Control (CD Mode for CD Audio Play)
Pressing the TUNE control allows the setting of the Tone, Fade, and Balance. See Radio Mode.

AM/FM Button (CD Mode for CD Audio Play)
Switches the Radio to the Radio mode.

RND/PTY Button (Random Play Button) (CD Mode for CD Audio Play)
Press this button while the CD is playing to activate Random Play. This feature plays the selections on the compact disc in random order to provide an interesting change of pace.

Press the SEEK button to move to the next randomly selected track.

Press the RND button a second time to stop Random play.

Buttons 1 - 6 (CD Mode for CD Audio Play)
Selects disc positions 1 - 6 for Play/Load/Eject.

Notes On Playing MP3 Files

The radio can play MP3 files, however, acceptable MP3 file recording media and formats are limited. When writing MP3 files, pay attention to the following restrictions.

Supported Media (Disc Types)
The MP3 file recording media supported by the radio are CD-ROM, CD-R and CD-RW.

Supported Medium Formats (File Systems)
The medium formats supported by the radio are ISO 9660 Level 1 and Level 2 and includes the Joliet extension. When reading discs recorded using formats other than ISO 9660 Level 1 and Level 2, the radio may fail to read files properly and may be unable to play the file normally. UDF and Apple HFS formats are not supported.

The radio uses the following limits for file systems:

- Maximum number of directory levels: 15
- Maximum number of files: 255
- Maximum number of folders: 100

- Maximum number of characters in file/folder names:
  - Level 1: 12 (including a separator ″.″ and a 3-character extension)
  - Level 2: 31 (including a separator ″.″ and a 3-character extension)

Multisession disc formats are supported by the radio. Multisession discs may contain combinations of normal CD audio tracks and computer files (including MP3 files). Discs created with an option such as ″keep disc open after writing″ are most likely multisession discs. The use of multisession for CD audio or MP3 playback may result in longer disc loading times.

Supported MP3 File Formats

The radio will recognize only files with the *.mp3 extension as MP3 files. Non-MP3 files named with the *.mp3 extension may cause playback problems. The radio is designed to recognize the file as an invalid MP3 and will not play the file.

When using the MP3 encoder to compress audio data to an MP3 file, the bit rate and sampling frequencies in the following table are supported. In addition, variable bit rates (VBR) are also supported. The majority of MP3 files use a 44.1 kHz sampling rate and a 192, 160, 128, 96 or VBR bit rates.

MPEG Specification	Sampling Frequency (kHz)	Bit rate (kbps)
MPEG-1 Audio Layer 3	48, 44.1, 32	320, 256, 224, 192, 160, 128, 112, 96, 80, 64, 56, 48, 40, 32
MPEG-2 Audio Layer 3	24, 22.05, 16	160, 128, 144, 112, 96, 80, 64, 56, 48, 40, 32, 24, 16, 8

ID3 Tag information for artist, song title and album title are supported for version 1 ID3 tags. ID3 version 2 is not supported by the radios.

Playlist files are not supported. MP3 Pro files are not supported.

Playback of MP3 Files
When a medium containing MP3 data is loaded, the radio checks all files on the medium. If the medium contains a lot of folders or files, the radio will take more time to start playing the MP3 files.

Loading times for playback of MP3 files may be affected by the following:

- Media - CD-RW media may take longer to load than CD-R media
- Medium formats - Multisession discs may take longer to load than non-multisession discs
- Number of files and folders - Loading times will increase with more files and folders

To increase the speed of disc loading, it is recommended to use CD-R media and single-session discs. To create a single-session disc, enable the Disc at Once option before writing to the disc.

Operating Instructions - (CD Mode for MP3 Audio Play)

SEEK Button (CD Mode for MP3 Play)
Pressing the right side of the SEEK button plays the next MP3 File. Pressing the left side of the SEEK button plays the beginning of the MP3 file. Pressing the button within the first ten seconds plays the previous file.

LOAD/EJECT Button (CD Mode for MP3 Play)

LOAD/EJECT - Load

Press the LOAD/ EJECT button and the push-button with the corresponding number where the CD is being loaded. The radio will display PLEASE WAIT and prompt when to INSERT DISC. After the radio displays "LOAD DISC" insert the CD into the player.

Radio display will show "LOADING DISC" when the disc is loading.

LOAD/EJECT - Eject

Press the LOAD/ EJECT button and the push-button with the corresponding number where the CD was loaded and the disc will unload and move to the entrance for easy removal. Radio display will show "EJECTING DISC" when the disc is being ejected and prompt the user to remove the disc. If you have ejected a disc and have not removed it within 15 seconds, it will be reloaded. If the CD is not removed, the radio will continue to play the non-removed CD. If the CD is removed and there are other CDs in the radio, the radio will play the next CD after a two minute timeout. If the CD is removed and there are no other CD's in the radio, the radio will remain in CD mode and display "INSERT DISC" for two minutes. After two minutes the radio will go to the previous tuner mode.

MSG or INFO Button (CD Mode for MP3 Play)

Press and MSG or INFO button while playing MP3 disc. The radio scrolls through the following TAG information: Song Title, Artist, File Name, and Folder Name (if available).

Press the MSG or INFO button once more to return to "elapsed time" priority mode.

Press and hold the MSG or INFO button while in the message display priority mode or elapsed time display priority mode will display the song title for each file.

RW/FF (CD Mode for MP3 Play)
Press the FF side of the button to move forward through the MP3 selection.

TUNE Control (CD Mode for MP3 Play)
Pressing the TUNE control allows the adjustment of Tone, Balance, and Fade.

AM/FM Button (CD Mode for MP3 Play)
Switches back to Radio mode.

RND/ PTY Button (CD Mode for MP3 Play)
Pressing this button plays files randomly.

SET/DIR Button (CD Mode for MP3 Play)
Press the SET/DIR Button to display folders, when playing an MP3 discs that have a file/folder structure. Turn the TUNE control to display available folders or move through available folders. Press the TUNE control to select a folder.

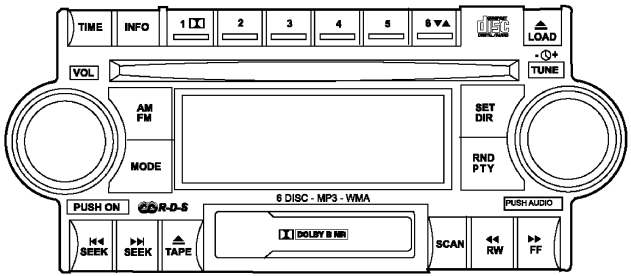
Buttons 1 - 6 (CD Mode for MP3 Play)
Selects disc positions 1 - 6 for Play/Load/Eject.

Operating Instructions - Hands-Free Phone (If Equipped)
Refer to Hands Free Phone in Section 3 of this Owner's Manual.

Operating Instructions - Satellite Radio Mode (If Equipped)
Refer to the Satellite Radio section of this Owner's Manual.

SALES CODE 746–111 (RAK) – AM/FM/CASSETTE/CD (6-DISC) RADIO WITH OPTIONAL SATELLITE RADIO, HANDS FREE PHONE, MP3, and WMA CAPABILITIES

NOTE: The radio sales code is located on the lower right side of your radio faceplate.



RAK Radio

Operating Instructions - Radio Mode

NOTE: The ignition switch must be in the ON or ACC position to operate the radio.

Power Switch/Volume Control (Rotary)
Press the ON/VOL control to turn the radio ON. Press the ON/VOL a second time to turn OFF the radio.

Electronic Volume Control
The electronic volume control turns continuously (360 degrees) in either direction without stopping. Turning the volume control to the right increases the volume and to the left decreases it.

When the audio system is turned on, the sound will be set at the same volume level as last played.

Mode Button (Radio Mode)
Press the Mode button repeatedly to select between the CD player, Cassette, or Satellite Radio.

SEEK Button (Radio Mode)
Press and release the SEEK button to search for the next station in either AM/FM or Satellite (if equipped) mode. Press the right side of the button to seek up and the left side to seek down. The radio will remained tuned to the new station until you make another selection. Holding the button and will bypass stations without stopping until you release it.

SCAN Button (Radio Mode)
Pressing the SCAN button causes the tuner to search for the next station, in either AM, FM or Satellite (if equipped) frequencies, pausing for five seconds (satellite scan eight seconds) at each listenable station before continuing to the next. To stop the search, press SCAN a second time.

TIME Button
Press the time button and the time of day will display for five seconds.

Clock Setting Procedure

1. Press and hold the TIME button until the hours blink.

2. Adjust the hours by turning the right side Tune/Audio control.

3. After the hours are adjusted, press the right side Tune/Audio control to set the minutes. The minutes will begin to blink.

4. Adjust the minutes using the right side Tune/Audio control.

5. To exit, press any button/knob or wait five seconds.

INFO Button (Radio Mode)
Press the INFO button for an RBDS station (one with call letters displayed). The radio will return a Radio Text message broadcast (if available) from an FM station (FM mode only).

RW/FF (Radio Mode)
Pressing the rewind/fast forward button causes the tuner to search for the next frequency in the direction of the arrows. This feature operates in either AM, FM or Satellite (if equipped) frequencies.

TUNE Control (Radio Mode)
Turn the right side rotary control to increase or decrease the frequency.

AM/FM Button (Radio Mode)
Press the button to select AM or FM modes.

Setting the Tone, Balance, and Fade
Press the rotary TUNE control and BASS will display. Turn the TUNE control to the right or left to increase or decrease the Bass tones.

Press the rotary TUNE control a second time and MID will display. Turn the TUNE control to the right or left to increase or decrease the Mid-Range tones.

Press the rotary TUNE control a third time and TREBLE will display. Turn the TUNE control to the right or left to increase or decrease the Treble tones.

Press the rotary TUNE control a fourth time and BAL will display. Turn the TUNE control to the right or left to adjust the sound level from the right or left side speakers.

Press the rotary TUNE control a fifth time and FADE will display. Turn the TUNE control to the right or left to adjust the sound level between the front and rear speakers.

Press the rotary TUNE control again to exit setting tone, balance, and fade.

RND/PTY Button (Radio Mode)
Pressing this button once will turn on the PTY mode for five seconds. If no action is taken during the five-second time out, the PTY icon will turn off. Turning the tune knob within five seconds will allow the program format type to be selected. Many radio stations do not currently broadcast PTY information.

Turn the tune knob to select the following format types:

Program Type	16 Digit-Character Display
No program type or undefined	None
News	News
Information	Information
Sports	Sports
Talk	Talk
Rock	Rock
Classic Rock	Classic_Rock
Adult Hits	Adult_Hits
Soft Rock	Soft_Rock
Top 40	Top_40
Country	Country
Oldies	Oldies
Soft	Soft
Nostalgia	Nostalgia
Jazz	Jazz
Classical	Classical
Rhythm and Blues	Rhythm_and_Blues
Soft Rhythm and Blues	Soft_R_&_B
Foreign Language	Foreign_Language
Religious Music	Religious_Music
Religious Talk	Religious_Talk
Personality	Personality
Public	Public
College	College
Unassigned	
Weather	Weather

By pressing the SEEK button when the PTY icon is displayed, the radio will be tuned to the next frequency station with the same selected PTY name. The PTY function only operates when in the FM mode.

If a preset button is activated while in the PTY (Program Type) mode, the PTY mode will be exited and the radio will tune to the preset station.

NOTE: If you have selected a PTY with the tune knob, simply pressing the TUNE button in will go directly to a "PTY seek".

Buttons 1 - 6 (Radio Mode)
These buttons tune the Radio to the stations that you commit to push-button memory {12 AM, 12 FM, and 12 Satellite (if equipped) stations}.

Operating Instructions — Tape Player

Insert the cassette with the exposed tape side toward the left and the mechanical action of the player will gently pull the cassette into the play position.

NOTE: When subjected to extremely cold temperatures, the tape mechanism may require a few minutes to warm up for proper operation. Sometimes poor playback may be experienced due to a defective cassette tape. Clean and demagnetize the tape heads at least twice a year.

Seek Button

Press the SEEK button up for the next selection on the tape and down to return to the beginning of the current selection.

Press the SEEK button up or down to move the track number to skip forward or backward one to six selections. Press the SEEK button once to move one selection, twice to move two selections, etc.

Fast Forward (FF)

Press the FF button up momentarily to advance the tape in the direction that it is playing. The tape will advance until the button is pressed again or the end of the tape is reached. At the end of the tape, the tape will play in the opposite direction.

Rewind (RW)

Press the RW button momentarily to reverse the tape direction. The tape will reverse until the button is pressed again or until the end of the tape is reached. At the end of the tape, the tape will play in the opposite direction.

Tape Eject

Press this button and the cassette will disengage and eject from the radio.

SCAN Button

Press this button to play 10 seconds of each selection. Press the SCAN button a second time to cancel the feature.

Changing Tape Direction

If you wish to change the direction of tape travel (side being played), press Preset 6. The lighted arrow in the display window will show the new direction.

Metal Tape Selection

If a standard metal tape is inserted into the player, the player will automatically select the correct equalization.

Pinch Roller Release

If ignition power or the radio ON/OFF switch is turned off, the pinch roller will automatically retract to protect the tape from any damage. When power is restored to the tape player, the pinch roller will automatically reengage and the tape will resume play.

Noise Reduction

The Dolby Noise Reduction System* is on whenever the tape player is on, but may be switched off.

To turn off the Dolby Noise Reduction System: Press Preset 1 after you insert the tape. The NR light in the display will go off when the Dolby System is off.

* "Dolby" noise reduction is manufactured under license from Dolby Laboratories Licensing Corporation. Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Operating Instructions - (CD Mode for CD Audio Play)

NOTE: The ignition switch must be in the ON or ACC position to operate the radio.

NOTE: This Radio is capable of playing compact discs (CD), recordable compact discs (CD-R), rewritable compact discs (CD-RW) compact discs with MP3 tracks and multi-session compact discs with CD and MP3 tracks and WMA.

Inserting Compact Disc(s)

CAUTION!
This CD player will accept 4 3/4 inch (12 cm) discs only. The use of other sized discs may damage the CD player mechanism.

You may eject a disc with the radio OFF.

If you insert a disc with the ignition ON and the radio ON, the unit will switch from radio to CD mode and begin to play when you insert the disc. The display will show the disc number, the track number, and index time in minutes and seconds. Play will begin at the start of track one.

SEEK Button (CD Mode for CD Audio Play)
Press the right side of the SEEK button for the next selection on the CD. Press the left side of the button to return to the beginning of the current selection, or return to the beginning of the previous selection if the CD is within the first five seconds of the current selection.

SCAN Button (CD Mode for CD Audio Play)
Press the SCAN button to scan through each track on the CD currently playing.

LOAD/EJECT Button (CD Mode for CD Audio Play)

LOAD/EJECT - Load

Press the LOAD/EJT button and the push-button with the corresponding number where the CD is being loaded. The radio will display PLEASE WAIT and prompt when to INSERT DISC. After the radio displays ″INSERT DISC,″ insert the CD into the player.

Radio display will show ″LOADING DISC″ when the disc is loading and “READING DISC” when the radio is reading the disc.

LOAD/EJT - Eject

Press the LOAD/EJT button and the push-button with the corresponding number where the CD was loaded and the disc will unload and move to the entrance for easy removal. Radio display will show ″EJECTING DISC″ when the disc is being ejected and prompt the user to remove the disc.

Press and hold the LOAD/EJT button for five seconds and all CDs will be ejected from the radio.

If you have ejected a disc and have not removed it within 15 seconds, it will be reloaded. If the CD is not removed, the radio will continue to play the non-removed CD. If the CD is removed and there are other CDs in the radio, the radio will play the next CD after a two-minute timeout. If the CD is removed and there are no other CDs

in the radio, the radio will remain in CD mode and display "INSERT DISC" for two minutes. After two minutes, the radio will go to the previous tuner mode.

The disc can be ejected with the radio and ignition OFF.

TIME Button (CD Mode for CD Audio Play)
Press this button to change the display from a large CD playing time display to a small CD playing time display.

RW/FF (CD Mode for CD Audio Play)
Press and hold FF (Fast Forward) and the CD player will begin to fast forward until FF is released or RW or another CD button is pressed. The RW (Reverse) button works in a similar manner.

Press and hold the FF button to fast forward through the tracks. Release the FF button to stop the fast forward feature. If the RW button is pressed, the current track will reverse to the beginning of the track and begin playing.

TUNE Control (CD Mode for CD Audio Play)
Pressing the TUNE control allows the setting of the Tone, Fade, and Balance. See Radio Mode.

AM/FM Button (CD Mode for CD Audio Play)
Switches the Radio to the Radio mode.

RND/PTY Button (Random Play Button) (CD Mode for CD Audio Play)
Press this button while the CD is playing to activate Random play. This feature plays the selections on the compact disc in random order to provide an interesting change of pace.

NOTE: MP3 and WMA Random play are for file folders only.

Press the SEEK button to move to the next randomly selected track.

Press the RND button a second time to stop Random play.

Buttons 1 - 6 (CD Mode for CD Audio Play)
Selects disc positions 1 - 6 for Play/Load/Eject.

Notes On Playing MP3 Files

The radio can play MP3 files; however, acceptable MP3 file recording media and formats are limited. When writing MP3 files, pay attention to the following restrictions.

Supported Media (Disc Types)
The MP3 file recording media supported by the radio are CD-ROM, CD-R, and CD-RW.

Supported Medium Formats (File Systems)
The medium formats supported by the radio are ISO 9660 Level 1 and Level 2 and includes the Joliet extension. When reading discs recorded using formats other than ISO 9660 Level 1 and Level 2, the radio may fail to read files properly and may be unable to play the file normally. UDF and Apple HFS formats are not supported.

The radio uses the following limits for file systems:

- Maximum number of directory levels: 15
- Maximum number of files: 255
- Maximum number of folders: 100
- Maximum number of characters in file/folder names:
  - Level 1: 12 (including a separator ″.″ and a 3-character extension)
  - Level 2: 31 (including a separator ″.″ and a 3-character extension)

Multisession disc formats are supported by the radio. Multisession discs may contain combinations of normal CD audio tracks and computer files (including MP3 files). Discs created with an option such as ″keep disc open after writing″ are most likely multisession discs. The use of multisession for CD audio or MP3 playback may result in longer disc loading times.

Supported MP3 File Formats

The radio will recognize only files with the *.mp3 extension as MP3 files. Non-MP3 files named with the *.mp3 extension may cause playback problems. The radio is designed to recognize the file as an invalid MP3 and will not play the file.

When using the MP3 encoder to compress audio data to an MP3 file, the bit rate and sampling frequencies in the following table are supported. In addition, variable bit rates (VBR) are also supported. The majority of MP3 files use a 44.1 kHz sampling rate and a 192, 160, 128, 96 or VBR bit rates.

MPEG Specification	Sampling Frequency (kHz)	Bit rate (kbps)
MPEG-1 Audio Layer 3	48, 44.1, 32	320, 256, 224, 192, 160, 128, 112, 96, 80, 64, 56, 48, 40, 32
MPEG-2 Audio Layer 3	24, 22.05, 16	160, 128, 144, 112, 96, 80, 64, 56, 48, 40, 32, 24, 16, 8

ID3 Tag information for artist, song title, and album title are supported for version 1 ID3 tags. ID3 version 2 is not supported by the radios.

Playlist files are not supported. MP3 Pro files are not supported.

Playback of MP3 and WMA Files
When a medium containing MP3 data is loaded, the radio checks all files on the medium. If the medium contains a lot of folders or files, the radio will take more time to start playing the MP3 files.

Loading times for playback of MP3 and WMA files may be affected by the following:

- Media - CD-RW media may take longer to load than CD-R media
- Medium formats - Multisession discs may take longer to load than non-multisession discs
- Number of files and folders - Loading times will increase with more files and folders

To increase the speed of disc loading, it is recommended to use CD-R media and single-session discs. To create a single-session disc, enable the Disc at Once option before writing to the disc.

Operating Instructions - (CD Mode for MP3 and WMA Audio Play)

SEEK Button (CD Mode for MP3 and WMA Play)
Pressing the right side of the SEEK button plays the next file. Pressing the left side of the SEEK button plays the beginning of the file. Pressing the button within the first 10 seconds plays the previous file.

LOAD/EJECT Button (CD Mode for MP3 and WMA Play)

LOAD/EJT - Load

Press the LOAD/EJT button and the push-button with the corresponding number where the CD is being loaded. The radio will display PLEASE WAIT and prompt when to INSERT DISC. After the radio displays ″INSERT DISC,″ insert the CD into the player.

The radio display will show "LOADING DISC" when the disc is loading.

LOAD/EJT - Eject

Press the LOAD/EJT button and the push-button with the corresponding number where the CD was loaded and the disc will unload and move to the entrance for easy removal. Radio display will show "EJECTING DISC" when the disc is being ejected and prompt the user to remove the disc.

If you have ejected a disc and have not removed it within 15 seconds, it will be reloaded. If the CD is not removed, the radio will continue to play the non-removed CD. If the CD is removed and there are other CDs in the radio, the radio will play the next CD after a two-minute timeout. If the CD is removed and there are no other CDs in the radio, the radio will remain in CD mode and display "INSERT DISC" for two minutes. After two minutes, the radio will go to the previous tuner mode.

INFO Button (CD Mode for MP3 Play)
Press the INFO button while playing MP3 or WMA disc. The radio scrolls through the following TAG information: Song Title, Artist, File Name, and Folder Name (if available).

Press the INFO button once more to return to "elapsed time" priority mode.

Press and hold the INFO button while in the message display priority mode or elapsed time display priority mode will display the song title for each file.

RW/FF (CD Mode for MP3 and WMA Play)
Press the FF side of the button to move forward through the file or MP3 and WMA selection.

TUNE Control (CD Mode for MP3 Play)
Pressing the TUNE control allows the adjustment of Tone, Balance, and Fade.

AM/FM Button (CD Mode for MP3 Play)
Switches back to Radio mode.

RND/PTY Button (CD Mode for MP3 Play)
Pressing this button plays files randomly.

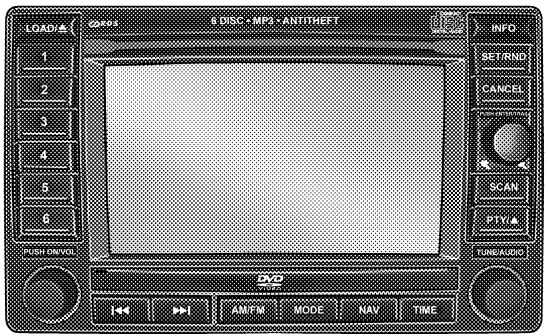
SET/DIR Button (CD Mode for MP3 Play)
Press the SET/DIR Button to display folders, when playing an MP3 discs that have a file/folder structure. Turn the TUNE control to display available folders or move through available folders. Press the TUNE control to select a folder.

Buttons 1 - 6 (CD Mode for MP3 Play)
Selects disc positions 1 - 6 for Play/Load/Eject.

Operating Instructions - Hands Free Phone (If Equipped)
Refer to "Hands-Free Phone" in Section 3 of the Owner's Manual.

Operating Instructions - Satellite Radio Mode (If Equipped)
Refer to the "Satellite Radio" section of the Owner's Manual.

SALES CODE 746–113 (REC) — AM/FM/CD (6–DISC) RADIO WITH NAVIGATION SYSTEM



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Satellite Navigation Radio with CD Player with MP3 Capability, sales code 746–113 (REC) - combines a Global-Positioning System-based navigation system with an integrated color screen to provide maps, turn identification, selection menus and instructions for selecting a variety of destinations and routes, AM/FM stereo radio and six-disc CD changer with MP3 capability.

Mapping information for navigation is supplied on a DVD that is loaded into the unit. One map DVD covers all of North America. Refer to the "Navigation User's Manual", in the Appendix at the back of this manual, for detailed operating instructions.

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Operating Instructions — Satellite Radio — If Equipped

Refer to the "Navigation User's Manual", in the Appendix at the back of this manual, for detailed operating instructions.

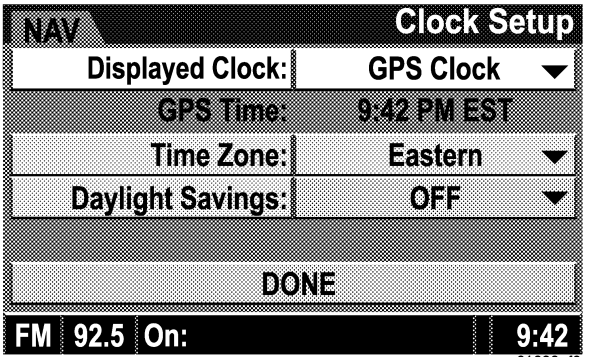
Setting the Clock

GPS Clock

The GPS receiver used in this system is synchronized to the time data being transmitted by the GPS satellites. The satellites' clock is Greenwich Mean Time (GMT). This is

the worldwide standard for time. This makes the system's clock very accurate once the appropriate time zone and daylight savings information is set.

1. At the **Main Menu** screen, highlight "Clock Setup" and press ENTER **OR** press and hold for three seconds the TIME button on the unit's faceplate. The **Clock Setup** screen appears.



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2. To show the GPS clock, select "Displayed Clock: GPS Clock" and press ENTER.

3. To adjust the time zone, Select "Time Zone" and press ENTER. Select the appropriate time zone and press ENTER.

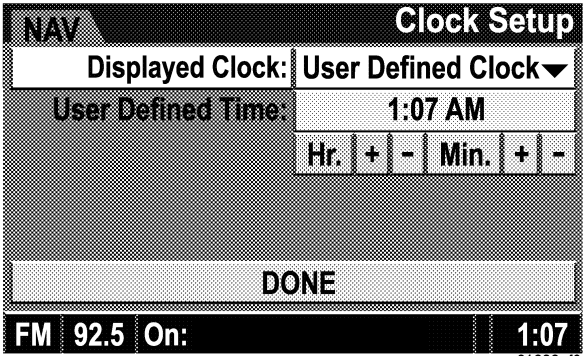
4. To turn daylight savings on or off, select "Daylight Savings" and press ENTER. Select "On" or "Off" and press ENTER.

5. Select DONE to exit from the clock setting mode. Press ENTER to save your changes. If you press CANCEL or NAV then your changes will not be saved.

User Defined Clock

If you wish to set the clock to a time different than the system clock, you can manually adjust the time by choosing the "User Defined Clock" option.

1. At the **Clock Setup** screen highlight "Displayed Clock: User Defined Clock".



2. To increase the clock by hours, make sure "HR +" is highlighted and press ENTER. Press ENTER again to increase the clock by another hour. You will see on the "User Defined Time" display the number of hours you have increased the clock by.

3. To decrease the clock by one hour, use the Select Encoder to highlight the "-" sign. Press ENTER. Press ENTER again to decrease the clock by another hour.

4. To increase the clock by minutes, make sure "MIN +" is highlighted and press ENTER. Press ENTER again to increase the clock by another minute.

5. To decrease the clock by minutes, use the Select Encoder to highlight the "-" sign. Press ENTER. Press ENTER again to decrease the clock by another minute.

6. Select "DONE" to exit from the clock setting mode. Press ENTER to save your changes. If you press CANCEL or NAV then your changes will not be saved.

SATELLITE RADIO, SALES CODE 78B-005 — IF EQUIPPED

Satellite radio uses direct satellite to receiver broadcasting technology to provide clear digital sound, coast to coast. The subscription service provider is Sirius™ Satellite Radio. This service offers over 130 channels of music, sports, news, entertainment, and programming for children, directly from its satellites and broadcasting studios.

NOTE: Sirius service is not available in Hawaii and has limited coverage in Alaska.

System Activation

Sirius Satellite Radio service is pre-activated, and you may begin listening immediately to the one year of audio service that is included with the factory-installed satellite radio system in your vehicle. Sirius will supply a welcome kit that contains general information, including how to setup your on-line listening account at no additional charge. For further information, call the toll-free number 888-539-7474, or visit the Sirius web site at www.sirius.com, or at www.siriuscanada.ca for Canadian residents.

Electronic Serial Number/Sirius Identification Number (ESN/SID)

Please have the following information available when calling:

1. The Electronic Serial Number/Sirius Identification Number (ESN/SID).

2. Your Vehicle Identification Number.

To access the ESN/SID, refer to the following procedure.

ESN/SID Access with REF (Sales Code 746–110) Radios

With the ignition switch in the ACC position and the radio OFF, press the CD Eject and TIME buttons simultaneously for three seconds. The first four digits of the 12-digit ESN/SID number will display. Press the SEEK

UP button to display the next four digits. Continue to press the SEEK UP button until all 12 ESN/SID digits display. The SEEK DOWN will page down until the first four digits display. The radio will exit the ESN/SID mode when any other button is pushed, the ignition is turned OFF, or five minutes have passed since any button was pushed.

ESN/SID Access with RAQ (Sales Code 746–112) and RAK (Sales Code 746–111) Radios

With the ignition switch in the ACC position and the radio OFF, press the CD Eject and TIME buttons simultaneously for three seconds. All twelve ESN/SID numbers will display. The radio will exit the ESN/SID mode when any other button is pushed, the ignition is turned OFF, or five minutes have passed since any button was pushed.

ESN/SID Access with REC (Sales Code 746–113) Navigation Radios

Please refer to your Navigation User's Manual.

With the ignition in the ACC position and the radio off, press the CD Eject and SET buttons simultaneously until the 12 digits of the ESN/SID appear on the screen.

Selecting Satellite Mode in REF (Sales Code 746–110), RAQ (Sales Code 746–112), And RAK (Sales Code 746–111) Radios

Selecting Satellite Mode — REF (Sales Code 746–110) Radio

Press the MODE button repeatedly until the word ″SAT″ appears in the display.

A CD may remain in the radio while in the Satellite radio mode.

Selecting Satellite Mode — RAQ (Sales Code 746–112) and RAK (Sales Code 746–111) Radio

Press the MODE button repeatedly until the word ″SAT″ appears in the display.

These radios will also display the current station name and program type. For more information, such as song title and artist, press the MSG or INFO button.

A CD or tape may remain in the radio while in the Satellite radio mode.

Selecting A Channel

Press and release the SEEK or TUNE knob to search for the next channel. Press the top of the button to search up and the bottom of the button to search down. Holding the TUNE button causes the radio to bypass channels until the button is released.

Press and release the SCAN button (if equipped) to automatically change channels every seven seconds. The radio will pause on each channel for seven seconds before moving on to the next channel. The word ″SCAN″ will appear in the display between each channel change. Press the SCAN button a second time to stop the search.

NOTE: Channels that may contain objectionable content can be blocked. Contact Sirius Customer Care at 888-539-7474 to discuss options for channel blocking or unblocking. Please have your ESN/SID information available.

Storing And Selecting Preset Channels

In addition to the 12 AM and 12 FM preset stations, you may also commit 12 satellite stations to pushbutton memory. These satellite channel preset stations will not erase any AM or FM preset memory stations. Follow the memory preset procedures that apply to your radio.

Using The PTY (Program Type) Button — If Equipped

Follow the PTY button instructions that apply to your radio.

PTY Button SCAN

When the desired program type is obtained, press the SCAN button within five seconds. The radio will play seven seconds of the selected channel before moving to the next channel of the selected program type. Press the SCAN button a second time to stop the search.

NOTE: Pressing the SEEK or SCAN button, while performing a music type scan, will change the channel by one and stop the search. Pressing a preset memory button during a music type scan will call up the memory channel and stop the search.

PTY Button SEEK

When the desired program is obtained, press the SEEK button within five seconds. The channel will change to the next channel that matches the program type selected.

Satellite Antenna

To ensure optimum reception on vehicles available with a luggage rack, do not place items on the roof around the rooftop antenna location. Metal objects placed within the line of sight of the antenna will cause decreased performance. Larger luggage items should be placed as far forward as possible. Do not place items directly on or above the antenna.

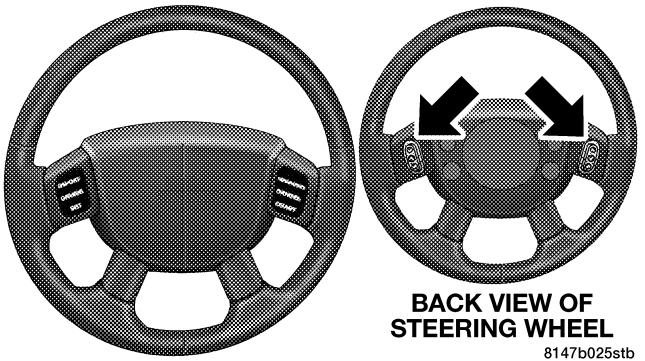
Reception Quality

Satellite reception may be interrupted due to one of the following reasons:

- The vehicle is parked in an underground parking structure or under a physical obstacle.
- Dense tree coverage may interrupt reception.
- Driving under wide bridges or along tall buildings can cause intermittent reception.
- Placing objects over or too close to the antenna can cause signal blockage.

REMOTE SOUND SYSTEM CONTROLS — IF EQUIPPED

The remote sound system controls are located on the rear surface of the steering wheel. Reach behind the wheel to access the switches.



Sterling Remote Sound System Controls

The right-hand control is a rocker type switch with a button in the center. Pressing the top of the switch will increase the volume and pressing the bottom of the switch will decrease the volume. The center button of the right-hand control will allow you to change the mode.

The left-hand control is a rocker type switch with a push button in the center. The function of the left-hand control is different, depending on which mode you are in.

The following describes the left-hand control operation in each mode.

Radio Operation

Pressing the top of the left side switch will seek up for the next listenable station and pressing the bottom of the switch will seek down for the next listenable station.

The button located in the center of the left-hand control will tune to the next pre-set station that you have programmed in the radio pre-set push-buttons.

Tape Player

Pressing the top of the switch once will go to the next selection on the cassette. Pressing the bottom of the switch once will go to the beginning of the current selection or to the beginning of the previous selection if it is within the first five seconds of the current selection.

If you press the switch up or down twice it plays the second selection; three times, it will play the third, etc.

The button in the center of the left-hand switch has no function in this mode.

CD Player

Pressing the top of the switch once will go to the next track on the CD. Pressing the bottom of the switch once will go to the beginning of the current track or to the beginning of the previous track if it is within one second after the current track; begins to play.

If you press the switch up or down twice it plays the second track, three times, it will play the third, etc.

The button in the center of the left-hand switch has no function in this mode.

CASSETTE TAPE AND PLAYER MAINTENANCE

To keep the cassette tapes and player in good condition, take the following precautions:

1. Do not use cassette tapes longer than C-90; otherwise, sound quality and tape durability will be greatly diminished.

2. Keep the cassette tape in its case to protect from slackness and dust when it is not in use.

3. Keep the cassette tape away from direct sunlight, heat and magnetic fields such as the radio speakers.

4. Before inserting a tape, make sure that the label is adhering flatly to the cassette.

5. A loose tape should be corrected before use. To rewind a loose tape, insert the eraser end of a pencil into the tape drive gear and twist the pencil in the required direction.

Maintain your cassette tape player. The head and capstan shaft in the cassette player can pick up dirt or tape deposits each time a cassette is played. The result of deposits on the capstan shaft may cause the tape to wrap around and become lodged in the tape transport. The other adverse condition is low or "muddy" sound from one or both channels, as if the treble tone control were turned all the way down. To prevent this, you should periodically clean the head with a commercially available wet cleaning cassette.

As preventive maintenance, clean the head about every 30 hours of use. If you wait until the head becomes very dirty (noticeably poor sound), it may not be possible to remove all deposits with a simple wet cleaning cassette.

COMPACT DISC MAINTENANCE

To keep the compact discs in good condition, take the following precautions:

1. Handle the disc by its edge; avoid touching the surface.

2. If the disc is stained, clean the surface with a soft cloth, wiping from center to edge.

3. Do not apply paper or tape to the disc; avoid scratching the disc.

4. Do not use solvents such as benzene, thinner, cleaners, or antistatic sprays.

5. Store the disc in its case after playing.

6. Do not expose the disc to direct sunlight.

7. Do not store the disc where temperatures may become too high.

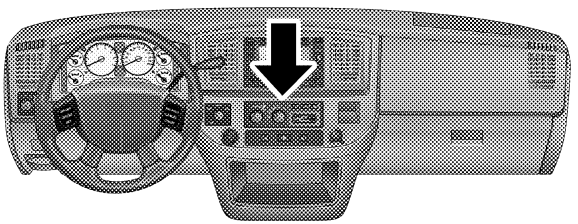
NOTE: If you experience difficulty in playing a particular disc, it may be damaged, oversized, or have theft protection encoding. Try a known good disc before considering disc player service.

RADIO OPERATION AND CELLULAR PHONES

Under certain conditions, the operation of a cellular phone in your vehicle can cause erratic or noisy performance from your radio. This condition may be lessened or eliminated by relocating the cellular phone antenna. This condition is not harmful to the radio. If your radio performance does not satisfactorily "clear" by the repositioning of the antenna, it is recommended that the radio volume be turned down or off during cellular phone operation.

CLIMATE CONTROLS

The controls for the heating and ventilation system in this vehicle consist of a series of rotary knobs. These comfort controls can be set to obtain desired interior conditions.



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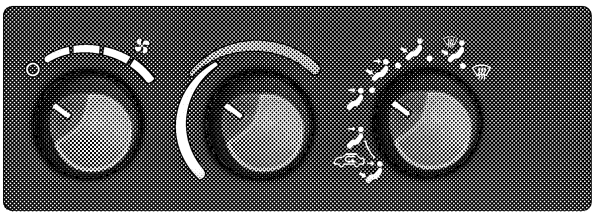
Sterling Climate Control Location

Heater Only — If Equipped



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Manual Heating Controls

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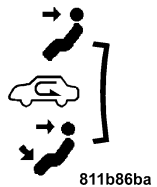
The mode control (at the right of the control panel) can be set in any of the following positions:

NOTE: To improve your selection choices, the system allows you to operate at intermediate positions between the major modes. These intermediate positions are identified by the small dots.

Panel

Outside air flows through the outlets located in the instrument panel.

Recirculation Modes (Panel or Bi-Level)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Select the recirculation modes when the outside air contains smoke or odors. This feature allows for recirculation of interior air only. Air flows through the panel outlets in this mode. Air flows through the panel only or through both the panel and floor vents depending on the selected mode (panel vs bi-level).

Bi-Level

Outside air flows through the outlets located in the instrument panel and at the floor.

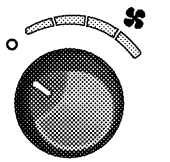
Mix

Outside air flows in equal proportions through the floor and defroster outlets.

Defrost

Outside air is primarily directed to the windshield through the defroster outlets located at the base of the windshield, and the demister outlets located at the edge of each side of the instrument panel.

Blower Control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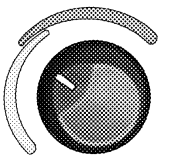
The rotary knob on the left of the control panel is the blower control. Turn the knob clockwise to one of the four positions to obtain the blower speed you desire. To turn the blower off, turn the knob to the far left position.

Temperature Control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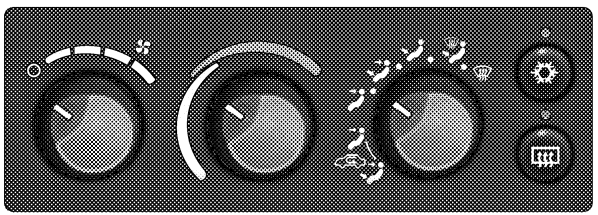
The rotary knob at the center of the control panel controls the temperature of the interior air. You can choose your degree of comfort by rotating the knob. The coldest temperature setting is to the extreme left (blue region) and the warmest setting is to the extreme right (red region) of the rotation.

Air Conditioning and Heating — If Equipped



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Air Conditioning And Heating

Air Conditioning Operation

To turn on the air conditioning, set the fan control at any speed and press the snowflake button located at the right of the control panel. Conditioned air will be directed through the outlets selected by the mode control. A light in the snowflake button shows that the air conditioning is on. Press the button a second time to turn the air conditioning off.

Slight changes in engine speed or power may be noticed when the air conditioning compressor is on. This is a normal occurrence, as the compressor will cycle on and off to maintain comfort and increase fuel economy.

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The mode control (at the right of the control panel) can be set in any of the following positions:

NOTE: To improve your selection choices, the system allows you to operate at intermediate positions between the major modes. These intermediate positions are identified by the small dots.

Recirculation Modes (Panel or Bi-Level)

Select the recirculation modes when the outside air contains smoke, odors, high humidity, or if rapid cooling is desired. This feature allows for recirculation of interior air only. Air flows through the panel only or through both the panel and floor vents depending on the selected mode (panel vs bi-level).

NOTE: Selecting a "Recirculation Mode" mode does not necessarily consume more fuel than normal A/C mode.

Panel

Outside air flows through the outlets located in the instrument panel.

Bi-Level

Outside air flows through the outlets located in the instrument panel and at the floor.

Floor

Outside air flows primarily through the floor outlets located under the instrument panel.

Mix

Outside air flows in equal proportions through the floor and defroster outlets, and the air conditioning may be on.

Defrost

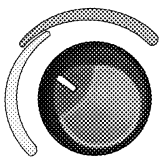
Outside air is primarily directed to the windshield through the defroster outlets located at the base of the windshield, and the demister outlets located at the edge of each side of the instrument panel, and the air conditioning may be on.

Blower Control

816463cd

The rotary knob on the left of the control panel is the blower control. Turn the knob clockwise to one of the four positions to obtain the blower speed you desire. To turn the blower off, turn the knob to the far left position.

Temperature Control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The rotary knob at the center of the control panel controls the temperature of the interior air. You can choose your degree of comfort by rotating the knob. The coldest temperature setting is to the extreme left (blue region) and the warmest setting is to the extreme right (red region) of the rotation.

Circulation

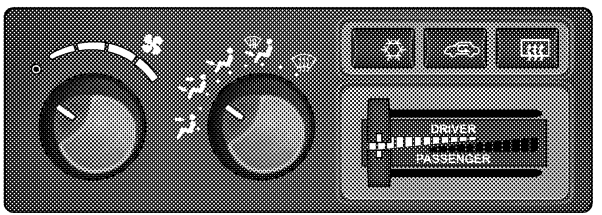
The cab is designed with features to promote outside air circulation. There are grilles in the cab back panel. These are air exhausters that provide the means for regular exchange of cab air.

Side window demisters direct air flow specifically to the window glass to help prevent interior fogging of the glass. They are located in the extreme outside upper edges of the instrument panel. The demisters also provide extra air ducts for circulation. They are in operation whenever the Floor, Mix or Defrost modes are in use. To remove frost from the side windows, it is best to use the full defrost mode.

NOTE: When you turn off the engine you may hear a hissing sound from under the hood for a short period of time. This is a normal condition that occurs if the air conditioning system has been on. It is not an indication of a problem with the air conditioning system.

Air Conditioning With Dual Zone Temperature Control — If Equipped

With the Dual Zone Temperature Control System, each front seat occupant can independently control the temperature of air coming from the outlets on their side of the vehicle.



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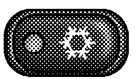
Dual Zone Control Head

Air Conditioning and Heating Operation

To turn on the air conditioning, set the fan control at any speed and press the snowflake button located on the control panel. Conditioned air will be directed through the outlets selected by the mode control. A light in the snowflake button shows that the air conditioning is on. Press the button a second time to turn the air conditioning off.

A/C Push-button



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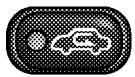
With the fan control in the ON position, pushing the A/C button turns on the air conditioning compressor. An indicator light on the button shows that the air conditioning compressor is on. Conditioned air is now directed through the mode outlets selected. Pushing the button a second time turns the compressor OFF.

Recirculation Pushbutton



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Pushing the Recirculation button allows interior air to recirculate continuously in any position except defrost and defrost/floor mode for rapid cool down of the interior. Refer to "Fast Cooldown" in this section.

Mode Control

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The mode control allows you to choose from several patterns of air distribution.

NOTE: To improve your selection choices, the system allows you to operate at intermediate positions between the major modes. These intermediate positions are identified by the small dots and give an even blend of both modes.

Panel

Outside air flows through the outlets located in the instrument panel. These outlets can be adjusted to direct the airflow.

Bi-Level

Air flows through the outlets located in the instrument panel and those located on the floor.

NOTE: There is a difference in temperature between the upper and lower outlets for added comfort. The warmer air goes to the floor outlets. This feature gives improved comfort during sunny but cool conditions.

Heat

Outside air flows primarily through the floor outlets located under the instrument panel.

4

Mix

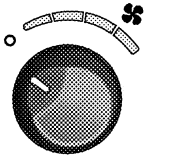
Outside air flows in equal proportions through the floor and defroster outlets.

Defrost

Outside air is primarily directed to the windshield through the defroster outlets located at the base of the windshield and side window demist outlets.

NOTE: The air conditioning compressor operates in both Mix and Defrost or a blend of these modes, even if the A/C button has not been pressed. This dehumidifies the air to help dry the windshield.

Blower Control



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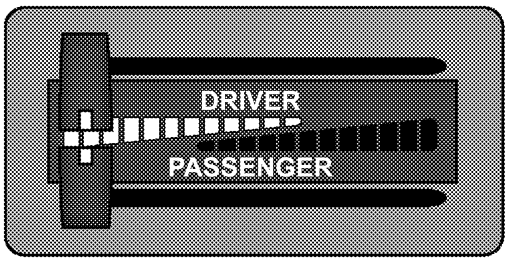
The rotary knob on the left of the control panel is the blower control. Turn the knob clockwise to one of the four positions to obtain the blower speed you desire. To turn the blower off, turn the knob to the far left position.

Dual Zone Temperature Control



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Dual Zone Temperature Control

Use this control to regulate the temperature of the air inside the passenger compartment. This is accomplished by having separate temperature control slides for both the driver and front passenger. The blue area of the scale indicates cooler temperatures, while the red area indicates warmer temperatures.

Circulation

The cab is designed with features to promote outside air circulation. There are grilles in the cab back panel. These are air exhausters that provide the means for regular exchange of cab air.

Side window demisters direct air flow specifically to the window glass to help prevent interior fogging of the glass. They are located in the extreme outside upper edges of the instrument panel. The demisters also provide extra air ducts for circulation. They are in operation whenever the Floor, Mix or Defrost modes are in use.

NOTE: When you turn off the engine you may hear a hissing sound from under the hood for a short period of time. This is a normal condition that occurs if the air conditioning system has been on. It is not an indication of a problem with the air conditioning system.

Operating Tips

Fast Cooldown

For a fast cooldown, turn the blower fan rotary knob to the extreme right position, turn the mode control to the panel fresh position, press the snowflake button to turn on the air conditioning, and drive with the windows open for the first few minutes. Once the hot air has been expelled, close the windows and press the recirculation pushbutton on dual zone control, or switch the mode from panel/fresh to panel/recirculate on single zone control. When a comfortable condition has been reached, choose a mode position and adjust the temperature control slide and blower speed as necessary to maintain comfort. For high humidity conditions it may be necessary to remain in the Recirculation mode to maintain comfort.

Window Fogging

Windows will fog on the inside when the humidity inside the vehicle is high. This often occurs in mild or cool temperatures when it's rainy or humid. In most cases turning on the air conditioning (pressing the snowflake button) will clear the fog. Adjust the temperature control, air direction and blower speed to maintain comfort.

As the temperature gets colder it may be necessary to direct air onto the windshield by using the Mix mode position on the control. Adjust the temperature control and blower speed to maintain comfort. Higher blower speeds will reduce fogging. Interior fogging on the windshield can be quickly removed by selecting the defrost mode.

Regular cleaning of the inside of the windows with a non-filming cleaning solution (vinegar and water works very well) will help prevent contaminates (cigarette smoke, perfumes, etc.) from sticking to the windows. Contaminates increase the rate of window fogging.

Summer Operation
Air conditioned vehicles must be protected with a high quality antifreeze coolant during summer to provide proper corrosion protection and to raise the boiling point of the coolant for protection against overheating. A 50 % concentration is recommended. Refer to "Engine Coolant" under " Fluids, Lubricants and Genuine Parts" in section 7.

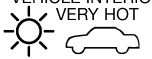
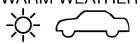
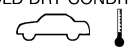
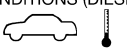
When using the air conditioner in extremely heavy traffic in hot weather, especially when towing a trailer, additional engine cooling may be required. If this situation is encountered, operate the transmission in a lower gear to increase engine RPM, coolant flow and fan speed. When stopped in heavy traffic, it may be necessary to shift into NEUTRAL and depress the accelerator slightly for fast idle operation to increase coolant flow and fan speed.

NOTE: The idle speed will automatically increase to 1000 RPM at elevated coolant temperatures to improve engine cooling.

Your air conditioning system is also equipped with an automatic recirculation system. When the system senses a heavy load or high heat conditions, it may use partial Recirculation A/C mode to provide additional comfort.

Winter Operation
When operating the system during the winter months, make sure the air intake, located directly in front of the windshield, is free of ice, slush, snow, or other obstructions.

Operating Tips Chart

WEATHER	CONTROL SETTINGS
HOT WEATHER AND VEHICLE INTERIOR IS VERY HOT 	Start the vehicle, open the windows and turn the blower control knob to the high position (full clockwise). Set Mode control knob at or between and . Set temperature control to full cold and press the button on. After the hot air has been expelled, close the windows and turn the mode control knob to the setting (counterclockwise) at either or , or press the button (if so equipped). Once comfortable, choose a mode position and adjust temperature control and blower speed as necessary for comfort.
WARM WEATHER 	If sunny, set the Mode control at or near and press the button on. If cloudy or dark, set the Mode control at or near . No is necessary.
COOL OR COLD HUMID CONDITIONS	If sunny, set the Mode control at or between and , then press the button on. If cloudy or dark set the Mode control at or near . No is necessary.
COLD DRY CONDITIONS 	In cloudy or dark weather set the Mode control at or near . If sunny, set the Mode control at or between and , and for snowy or very cold weather requiring extra heat to the windshield, use .
EXTREME COLD CONDITIONS (DIESEL) 	Using re-circulated air can aid initial warm-up in extreme cold conditions. **NOTICE: Running in /MAX for long periods of time will result in window fogging. When this occurs, use until windows clear. This will deactivate /MAX. SINGLE ZONE VEHICLES:** Set the mode control at + /MAX, close the panel vents and set the temperature control to full hot. Turn blower control knob to low and gradually increase as air and engine temperature increase. **DUAL ZONE VEHICLES:** Set the mode control at , set both temperature controls to full hot and press the /MAX button. Turn blower control knob to low and gradually increase as air and engine temperature increase.
WINDOW FOGGING	In most cases turning on the Air-Conditioning (press the button) will clear the fog, then adjust temperature control, air direction and blower speed to maintain comfort. As it gets colder it may be necessary to direct air onto the windshield. If so, set the Mode control at or and adjust temperature control and blower speed to maintain comfort. Higher blower speeds will reduce fogging.

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STARTING AND OPERATING

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STARTING PROCEDURES – DIESEL ENGINES

Before starting your vehicle, adjust your seat, adjust both inside and outside mirrors, and fasten your seat belts.

The starter should not be operated for more than 15-second intervals. Waiting a few minutes between such intervals will protect the starter from overheating.

WARNING!

Be sure to turn off the engine and remove the key from the ignition switch if you want to rest or sleep in your vehicle. Accidents can be caused by inadvertently moving the shift lever or by pressing the accelerator pedal. This may cause excessive heat in the exhaust system, resulting in overheating and vehicle fire which may cause serious or fatal injuries.

WARNING!

Do not leave children or animals inside parked vehicles in hot weather. Interior heat build up may cause serious injury or death.

Automatic Transmission – If Equipped

Start the engine with the shift lever in NEUTRAL or PARK position. Apply the brake before shifting to any driving range.

The Cummins® Diesel engine is equipped with several features designed to assist cold weather starting and operation:

- The engine block heater is a resistance heater installed in the water jacket of the engine just above and behind the oil filter. It requires a 110–115 volt AC electrical outlet with a grounded, three-wire extension cord.

NOTE: The engine block heater cord is a factory installed option. If your vehicle is not equipped, heater cords are available from your authorized Sterling® dealer.

- A 12–volt heater built into the fuel filter housing aids in preventing fuel gelling. It is controlled by a built-in thermostat.
- A heated intake air system both improves engine starting and reduces the amount of white smoke generated by a warming engine.

Manual Transmission – If Equipped

Apply the parking brake, place the shift lever in NEUTRAL and depress the clutch pedal to the floor before starting the vehicle. This vehicle is equipped with a clutch interlocking ignition system. It will not start unless the clutch is fully depressed.

Normal Starting Procedure – Engine Manifold Air Temperature Above 66°F (19°C)

Observe the instrument panel cluster lights when starting the engine.

1. Always apply the parking brake.
2. Shift into PARK for an automatic transmission. For vehicles equipped with manual transmissions, fully depress and hold the clutch pedal and shift into NEUTRAL.
3. Turn the ignition key to the ON position and watch the instrument panel cluster lights.

CAUTION!

If WATER IN FUEL indicator light remains on DO NOT START engine before you drain water from the fuel filter to avoid engine damage. Refer to "Draining Fuel/Water Separator Filter (6.7L Diesel Engine)" under "Maintenance Procedures" in Section 7.

4. Turn the ignition key to START and crank the engine. Do not press the accelerator during starting.

CAUTION!

Do not crank engine for more than 15 seconds at a time as starter motor damage may result. Turn key to OFF and wait at least two minutes before trying again.

5. When the engine starts, release the key.
6. Check to see that there is oil pressure.
7. Release the parking brake.

Starting Procedure – Engine Manifold Air Temperature Below 66°F (19°C)

NOTE: The temperature displayed on the overhead console (if equipped) does not necessarily reflect the engine manifold air temperature. When certain engine temperatures fall below 66°F (19°C) the lights will remain on indicating the intake manifold heater system is active.

Follow the steps in the Normal Starting Procedure except:

CAUTION!

Do not crank engine for more than 15 seconds at a time or starter motor damage may result. Turn key to OFF and wait at least two minutes for starter to cool before repeating start procedure.

- The WAIT TO START light will remain on for a period of time (length of time depends on engine temperature).
- After the WAIT TO START light goes off, turn the ignition key to START. Do not press the accelerator during starting.
  - After engine start-up, check to see that there is oil pressure.
  - Allow the engine to idle about three minutes until the manifold heaters have completed the post-heat cycle.
  - Release the parking brake and drive.

NOTE: Engine idle speed will automatically increase to 1000 RPM at low coolant temperatures to improve engine warm-up.

NOTE: If the engine stalls or if the ignition switch is left ON for more than two minutes after the WAIT TO START light goes out, reset the grid heaters by turning the ignition switch to OFF for at least five seconds and then back ON. Repeat steps 3 through 7 of the normal starting procedure.

For Extremely Cold Weather Starting – Engine Manifold Air Temperature Below 0°F (-18°C)

In extremely cold weather below 0°F (-18°C) it may be beneficial to cycle the manifold heaters twice before

attempting to start the engine. This can be accomplished by turning the ignition OFF for at least five seconds and then back ON after the WAIT TO START light has gone off, but before the engine is started. However, repeated cycling of the manifold heaters will result in damage to the heater elements or reduced battery voltage.

Proceed by following the steps in the Normal Starting Procedure.

NOTE: If multiple pre-heat cycles are used before starting, additional engine run time may be required to maintain battery state of charge at a satisfactory level.

- If the engine stalls after the initial start, the ignition must be turned to the OFF position for at least five seconds and then to the ON position to recycle the manifold heaters.

NOTE: Excessive white smoke and poor engine performance will result if manifold heaters are not recycled.

- Heat generated by the manifold heaters dissipates rapidly in a cold engine. If more than two minutes pass between the time the WAIT TO START light goes OFF and the engine is started, recycle the manifold heaters by turning the ignition OFF for at least five seconds and then back ON.
- If the vehicle is driven and vehicle speed exceeds 19 mph (31 km/h) before the manifold heater post-heat (after start) cycle is complete, the manifold heaters will shut off.
- If the engine is started before the WAIT TO START light turns off, the preheat cycle will turn off.
- If the engine is cranked for more than 10 seconds, the post-heat cycle will turn off.

NOTE: Engine idle speed will automatically increase to 1000 RPM at low coolant temperatures to improve engine warm-up.

NOTE: When a diesel engine is allowed to run out of fuel or the fuel gels at low temperatures, air is pulled into the fuel system.

You may try priming as described below:

1. Add a substantial quantity of fuel to the tank (5 to 10 gal) (19 to 38 L) or eliminate the gelled fuel condition.

2. Crank the engine for one to two seconds. If the engine does not start, then turn the ignition back to the RUN position (do not turn the ignition back to the OFF position). The electric fuel transfer pump will continue to run and purge air from the system for about 20 seconds. After 20 seconds, attempt to start the engine again.

3. Start the engine using the Normal Starting Procedure.

4. Repeat the procedure if the engine does not start.

WARNING!

Do not open the high pressure fuel system when cranking the engine or with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.

NOTE: The engine may run rough until the air is forced from all the fuel lines.

Starting Fluids

WARNING!

STARTING FLUIDS or flammable liquids are NEVER TO BE USED in the Cummins® Diesel (see Warning label). Never pour diesel fuel, flammable liquid, starting fluids (ether) into the air cleaner canister, air intake piping, or turbocharger inlet in an attempt to start the vehicle. This could result in a flash fire and explosion causing serious personal injury and engine damage.

The engine is equipped with an automatic electric air preheating system. If the instructions in this manual are followed, the engine should start in all conditions.

WARNING!

Do not leave children or animals inside parked vehicles in hot weather. Interior heat build up may cause serious injury or death.

NORMAL OPERATION – DIESEL ENGINE

Observe the following when the engine is operating.

- All message center lights are off.
- Check Engine light is off.
- Engine Oil Pressure is above 10 psi (69 kPa) at idle.
- Low Oil Pressure light is off.

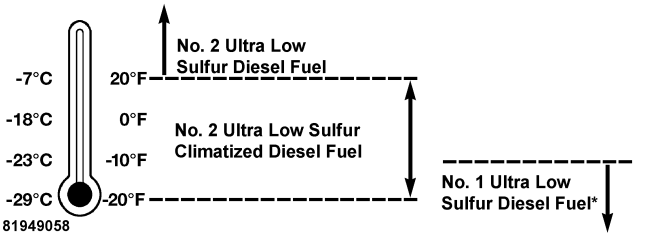
- Voltmeter Operation:
  - The voltmeter may show a gauge fluctuation at various engine temperatures. This cycling operation is caused by the post-heat cycle of the intake manifold heater system. The number of cycles and the length of the cycling operation is controlled by the engine control module. Post-heat operation can run for several minutes, and then the electrical system and voltmeter needle will stabilize.
  - The cycling action will cause temporary dimming of the headlamps, interior lamps, and also a noticeable reduction in blower motor speed.

Cold Weather Precautions

Operation in ambient temperature below 32°F (0°C) may require special considerations. The following charts suggest these options:

Fuel Operating Range

NOTE: Use "Ultra Low Sulfur Diesel Fuels" **ONLY.**



*No. 1 Ultra Low Sulfur Diesel Fuel should only be used where extended arctic conditions (-10°F/-23°C) exist.

NOTE:

- Use of Climatized Ultra Low Sulfur Diesel Fuel or Number 1 Ultra Low Sulfur Diesel Fuel results in a noticeable decrease in fuel economy.

- Climatized Ultra Low Sulfur Diesel Fuel is a blend of Number 2 Ultra Low Sulfur and Number 1 Ultra Low Sulfur Diesel Fuels which reduces the temperature at which wax crystals form in fuel.

NOTE: The engine requires the use of **"Ultra Low Sulfur Diesel Fuel"**. Use of incorrect fuel could result in engine and exhaust system damage. Refer to" Fuel Requirements" in Section 5.

Engine Block Heater

The engine block heater warms engine coolant and permits quicker starts in cold weather. Connect the heater cord to a ground-fault interrupter protected 110–115 volt AC electrical outlet with a grounded, three-wire extension cord.

The engine block heater cord is routed under the hood to the right side and can be located just behind the grille near the headlamp.

The block heater must be plugged in at least one hour to have an adequate warming effect on the coolant.

WARNING!

Remember to disconnect the cord before driving. Damage to the 110–115 volt electrical cord could cause electrocution.

NOTE: The block heater will require 110 Volts AC and 6.5 Amps to activate the heater element.

Block Heater Usage

A. **Temperatures below 0°F (-18°C)**

- Block Heater Required for 15W-40
- Block Heater Recommended for 5W-40

B. **Temperatures below -20°F (-29°C)**

- Block Heater Required for 5W-40

Winter Front Usage

If a winter front or cold weather cover is to be used, a percentage of the total grille opening area must be left uncovered to provide sufficient air flow to the charge air cooler and automatic transmission oil cooler. The percentage of opening must be increased with the increasing ambient air temperature and/or engine load. If the cooling fan can be heard cycling frequently, increase the size of the opening in the winter front.

Battery Blanket Usage

A battery loses 60% of its cranking power as the battery temperature decreases to 0°F (-18°C). For the same decrease in temperature, the engine requires twice as much power to crank at the same RPM. The use of 120 VAC powered battery blankets will greatly increase starting capability at low temperatures.

Arctic Operation

Where there are no provisions to keep the engine warm when it is operating in ambient temperatures consistently below -10°F (-23°C), use 5W-40 **synthetic** engine oil and fuel that meets the requirements in Section 7, "Maintenance Procedures," Engine Oil Selection.

Engine Warm-Up

Avoid full throttle operation when the engine is cold. When starting a cold engine, bring the engine up to operating speed slowly to allow the oil pressure to stabilize as the engine warms up.

NOTE: High-speed, no-load running of a cold engine can result in excessive white smoke and poor engine performance. No-load engine speeds should be kept under 1,200 RPM during the warm-up period, especially in cold ambient temperature conditions.

If temperatures are below 32°F (0°C), operate the engine at moderate speeds for five minutes before full loads are applied.

Engine Idling

Avoid prolonged idling, long periods of idling may be harmful to your engine because combustion chamber temperatures can drop so low that the fuel may not burn completely. Incomplete combustion allows carbon and varnish to form on piston rings and injector nozzles. Also, the unburned fuel can enter the crankcase, diluting the oil and causing rapid wear to the engine.

CAUTION!

Extended periods of idle time may not allow the vehicle's exhaust aftertreatment system to properly regenerate. This can lead to the illumination of the Malfunction Indicator Light (MIL) or an Electronic Vehicle Information Center (EVIC) warning message. Operating the engine for extended periods with the MIL illuminated or an EVIC warning message displayed can cause extensive engine and exhaust system damage.

NOTE: Your vehicle is equipped with a turbo speed limiter, this feature limits the engine speed to 1200 rpm when engine coolant temperatures are below 70°F (21°C). This feature is designed to protect the turbo charger from damage and will only operate in PARK or NEUTRAL.

NOTE: An optional driver-controlled high idle speed is available on automatic transmission equipped vehicles with speed control. This feature allows the driver to select an elevated idle speed between 1100 and 1500 rpms. Your dealer can enable this feature.

The optional driver-controlled high idle speed will help increase cylinder temperatures and provide additional cab heat, however, may still cause the exhaust aftertreatment system to not properly regenerate. Extended periods of idle time should be avoided.

NOTE:

- If ambient temperatures are low and the coolant temperature is below 200°F (93°C), the engine idle speed will slowly increase to 1000 RPM after 2 minutes of idle, if the following conditions are met:
- foot is off brake pedal and throttle pedal
- automatic transmission is in Park (P)
- vehicle speed is zero
- Applying the throttle will cancel fast idle
- If the engine is equipped with an exhaust brake, operating the exhaust brake at idle will greatly improve warm up rate and will help keep the engine close to operating temperature during extended idle.

CAUTION!
Use of aftermarket exhaust brakes is not recommended and could lead to engine damage

Stopping The Engine

Idle the engine a few minutes before routine shutdown. After full load operation, idle the engine three to five minutes before shutting it down. This idle period will allow the lubricating oil and coolant to carry excess heat away from the combustion chamber, bearings, internal

components, and turbocharger. This is especially important for turbocharged, charge air cooled engines.

NOTE: During engine shut down on vehicles equipped with manual transmissions, it is normal for the diesel engine to resonate heavily for a moment during engine shut off. When the engine is connected to a manual transmission, this resonance causes load gear rattle from the transmission. This is commonly referred to as "shut down rattle." The manufacturer recommends performing engine shut down with the clutch pedal pushed to the floor (clutch disengaged). When engine shut down is performed in this manner the rattle is reduced (not eliminated).

Driving Condition	Load	Turbo-charger Temperature	Idle Time (min.) Before Engine Shutdown
Stop and Go	Empty	Cool	Less than One
Stop and Go	Medium		One
Highway Speeds	Medium	Warm	Two
City Traffic	Maximum GCWR		Three
Highway Speeds	Maximum GCWR		Four
Uphill Grade	Maximum GCWR	Hot	Five

Engine Speed Control

CAUTION!

Prevent overspeeding the engine going downhill. When descending steep grades, use a combination of gears and service brakes to control vehicle/engine speed. Overspeed can cause severe engine damage.

Operating Precautions

Avoid Overheating The Engine

The temperature of the coolant (a mixture of 50% ethylene-glycol and 50% water) must not exceed the normal range of the temperature gauge 240°F (116°C) with a 16 psi (110 kPa) radiator cap.

Usually the coolant temperature indicated during operation will be to the left of center in the normal range of the gauge.

Avoid Low Coolant Temperature Operation

Continual operation at low coolant temperature below the normal range on the gauge 140°F (60°C) can be harmful to the engine. Low coolant temperature can cause incomplete combustion which allows carbon and varnish to form on piston rings and injector nozzles. Also, the unburned fuel can enter the crankcase, diluting the lubricating oil and causing rapid wear to the engine.

Cooling System Tips – Automatic Transmission

To reduce potential for engine and transmission overheating in high ambient temperature conditions, take the following actions:

- *City Driving —*
when stopped, put transmission in NEUTRAL and increase engine idle speed.

- *Highway Driving —*
reduce your speed.

- *Up Steep Hills —*

select a lower transmission gear, but try and keep the torque converter clutch engaged.

- *Air Conditioning —*

turn it off temporarily.

Do Not Operate The Engine With Low Oil Pressure

When the engine is at normal operating temperature, the minimum oil pressures required are:

Idle 700 to 800 RPM . . . . . 10 psi (69 kPa)
Full speed and load . . . . . 30 psi (207 kPa)

CAUTION!

If oil pressure falls to less than normal readings, shut the engine off immediately. Failure to do so could result in immediate and severe engine damage.

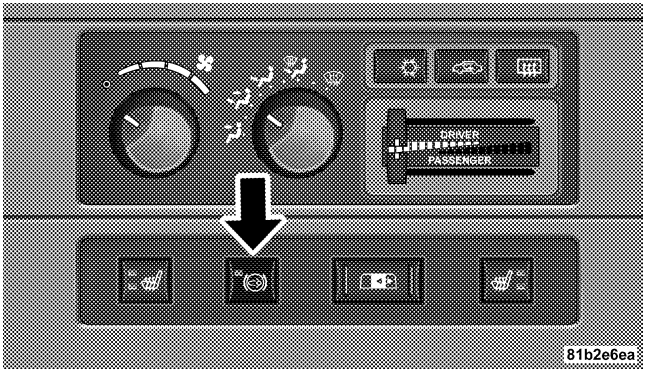
Do Not Operate The Engine With Failed Parts

Practically all failures give some warning before the parts fail. Be on the alert for changes in performance, sounds, and visual evidence that the engine requires service. Some important clues are:

- engine misfiring or vibrating severely
- sudden loss of power
- unusual engine noises
- fuel, oil or coolant leaks
- sudden change, outside the normal operating range, in the engine operating temperature
- excessive smoke
- oil pressure drop

DIESEL EXHAUST BRAKE (ENGINE BRAKING) – IF EQUIPPED

The exhaust brake feature will only function when the driver turns the exhaust brake switch to the ON position. Once the switch is in the ON position and the vehicle is moving faster than 5 mph (8 km/h); the exhaust brake will automatically operate when the driver removes pressure from the accelerator pedal. Exhaust braking is most effective when the engine RPM is higher. The automatic transmission has been programmed to downshift more aggressively when the exhaust brake is enabled to increase brake performance.



Exhaust Brake Switch

WARNING!

Do not use the Exhaust Brake feature when driving in icy or slippery conditions as the increased engine braking can cause the rear wheels to slide and the vehicle to swing around with the possible loss of vehicle control, which may cause an accident possibly resulting in personal injury or death.

NOTE: For optimum braking power it is recommended to use the Exhaust Brake while in Tow/Haul Mode.

The purpose of the exhaust brake (engine braking) feature is to supply negative (braking) torque to the engine. Typically, the engine braking is used for, but not limited to, vehicle towing applications where vehicle braking can be achieved by the internal engine power, thereby sparing the mechanical brakes of the vehicle.

Benefits of the exhaust brake are:

- vehicle driving control
- reduced brake fade
- longer brake life
- faster cab warm-up.

The exhaust brake feature can also be used to reduce the engine warm up time. To use the exhaust brake as a warm-up device, the vehicle must be moving less than 5 mph (8 km/h), the exhaust brake switch must be in the ON position, and the coolant temperature must below 180°F (82°C) and ambient temperature below 60°F (16°C).

AUTOMATIC TRANSMISSION

CAUTION!

Damage to the transmission may occur if the following precautions are not observed:

- **Shift into PARK only after the vehicle has come to a complete stop.**
- **Shift into or out of REVERSE only after the vehicle has come to a complete stop and the engine is at idle speed.**
- **Do not shift from REVERSE, PARK, or NEUTRAL into any forward gear when the engine is above idle speed.**
- **Before shifting into any gear, make sure your foot is firmly on the brake pedal.**

WARNING!

It is dangerous to shift the shift lever out of PARK or NEUTRAL if the engine speed is higher than idle speed. If your foot is not firmly on the brake pedal, the vehicle could accelerate quickly forward or in reverse. You could lose control of the vehicle and hit someone or something. Only shift into gear when the engine is idling normally and when your right foot is firmly on the brake pedal.

Automatic Transmission (6 Speed AS68RC) – If Equipped

The shift lever display, located in the instrument panel cluster, indicates the transmission gear range (the selector is illuminated for night driving). The shift lever is mounted on the right side of the steering column. You must depress the brake pedal, to pull the shift lever out of

PARK position (Brake Interlock System). To drive, move the shift lever from PARK or NEUTRAL to the desired drive position. Pull the shift lever toward you when shifting into REVERSE, SECOND, FIRST or PARK, or when shifting out of PARK.

Gear Ranges

DO NOT race the engine when shifting from PARK or NEUTRAL position into another gear range.

PARK

This gear position supplements the parking brake by locking the transmission. The engine can be started in this range. Never use PARK while the vehicle is in motion. Apply the parking brake when leaving the vehicle in this range. Always apply parking brake first, then place the shift lever in PARK position. On 4-wheel drive vehicles be sure that the transfer case is in a drive position!

WARNING!

Never use PARK position on an automatic transmission as a substitute for the parking brake. Always apply parking brake fully when parked to guard against vehicle movement and possible injury or damage.

WARNING!

Your vehicle could move and injure you and others if it is not completely in PARK. Check by trying to move the shift lever back and forth without first pulling it toward you after you have set it in PARK. Make sure it is in PARK before leaving the vehicle.

WARNING!

It is dangerous to shift the shift lever out of PARK or NEUTRAL if the engine speed is higher than idle speed. If your foot is not firmly on the brake pedal, the vehicle could accelerate quickly forward or in reverse. You could lose control of the vehicle and hit someone or something. Only shift into gear when the engine is idling normally and when your right foot is firmly on the brake pedal.

REVERSE

Use this range only after the vehicle has come to a complete stop.

NEUTRAL

Shift to NEUTRAL when the vehicle is standing for prolonged periods with the engine running. The engine may be started in this range. Set the parking brake if you must leave the vehicle.

DRIVE

This position provides all forward gears, including 4th gear direct and 5th or 6th (if equipped) gear overdrive (refer to Overdrive Operation, in this section). Use this range for most city and highway driving.

THIRD

Use this position for driving in slight heavy city traffic or on mountain roads where more precise speed control is desirable. Use it also when climbing long grades, and for engine braking when descending moderately steep grades. To prevent excessive engine speed do not exceed 40 mph (64 km/h) in this range.

SECOND
Use this position for driving in more severe conditions and lower speeds than THIRD. To prevent excessive engine speed do not exceed 25 mph (40 km/h) in this range.

FIRST
Use this position for driving up very steep hills and for engine braking at low speeds 12 mph (19 km/h) or less when going downhill. To prevent excessive engine speed, do not exceed 12 mph (19 km/h) in this range.

NOTE: Use caution when operating a heavily loaded vehicle in SECOND or FIRST gear selections in high ambients as torque converter slip can impose significant additional heat load on the cooling system.

Overdrive Operation
The Overdrive automatic transmission contains an electronically controlled 5th and 6th (if equipped) speed (Overdrive). The transmission will automatically shift from Drive to Overdrive if the following conditions are present:

- the transmission selector is in Drive;
- the engine coolant has reached normal operating temperature;
- vehicle speed is above approximately 38 mph (61 km/h) for 5th gear and 55 mph (89 km/h) for 6th gear;
- the "TOW HAUL O/D OFF" switch has not been activated;
- transmission has reached normal operating temperature.

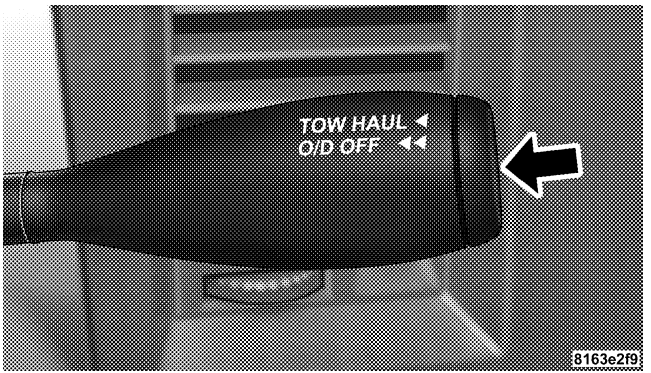
NOTE: If the vehicle is started in extremely cold temperatures, the transmission shift schedule initially restricts transmission operation in forward gear ranges to 3rd gear until the transmission fluid temperature rises to

a suitable level. During this condition, the ability of the vehicle to accelerate under heavily loaded conditions may be reduced. Refer also to the Note under torque converter clutch, in this section.

If the transmission temperature gets extremely hot, the transmission will automatically select the most desirable gear for operation at this temperature. If the transmission temperature becomes hot enough the TRANS TEMP light may illuminate and the transmission may downshift out of Overdrive until the transmission cools down. After cooldown, the transmission will resume normal operation.

The transmission will downshift from Overdrive to Drive if the accelerator pedal is fully depressed at vehicle speeds above approximately 37 mph (60 km/h) for 6th to 5th and 29 mph (47 km/h) for 5th to 4th.

When To Use "TOW HAUL" and "O/D OFF" Modes



Tow Haul O/D Off Switch

When driving in hilly areas, towing a trailer, carrying a heavy load, etc., and frequent transmission shifting occurs, press the "TOW HAUL O/D OFF" button once to select TOW HAUL. This will improve performance and

reduce the potential for transmission overheating or failure due to excessive shifting. When operating in "TOW HAUL" mode, 6th gear (if equipped) is disabled and 2-3 and 3-4 and 4–5 shift patterns are modified. Shifts into Overdrive (5th gear) are allowed during steady cruise (for improved fuel economy). Pressing the "TOW HAUL O/D OFF" button a second time to select O/D OFF will disable 5th and 6th gear completely, which should eliminate any excessive transmission shifting.

The "TOW HAUL" or "O/D OFF" light will illuminate in the instrument cluster to indicate when the switch has been activated. Pressing the switch a third time restores normal operation. If the "TOW HAUL" or "O/D OFF" modes are desired, the button must be pressed each time the engine is started.

WARNING!

Do not use the Tow Haul feature when driving in icy or slippery conditions as the increased engine braking can cause the rear wheels to slide and the vehicle to swing around with the possible loss of vehicle control, which may cause an accident possibly resulting in personal injury or death.

5

When To Lock Out Overdrive

When driving in hilly areas, towing a trailer, carrying a heavy load, etc., and frequent 6–5–6 or 5–4–5 transmission shifting occurs, press the "TOW HAUL" button. This will improve performance and reduce the potential for transmission overheating or failure due to excessive shifting.

Torque Converter Clutch

A feature designed to improve fuel economy has been included in the automatic transmission on your vehicle. A clutch within the torque converter engages automatically at calibrated speeds. This may result in a slightly different feeling or response during normal operation in high gear. When the vehicle speed drops or during acceleration when the transmission downshifts to 1st gear, the clutch automatically disengages.

NOTE: The torque converter clutch will not engage until the transmission fluid and engine coolant are warm [usually after 1-3 mi (1.6 - 4.8 km) of driving]. Because the engine speed is higher when the torque converter clutch is not engaged, it may seem as if the transmission is not shifting into Overdrive when cold. This is normal. Pressing the "TOW HAUL" button when the transmission is sufficiently warm will demonstrate that the transmission is able to shift into and out of Overdrive.

NOTE: If the vehicle has not been driven in several days, the first few seconds of operation after shifting the transmission into gear may seem sluggish. This is due to the fluid partially draining from the torque converter into the transmission. This condition is normal and will not cause damage to the transmission. The torque converter will refill within five seconds of shifting from PARK into any other gear position.

MANUAL TRANSMISSION

WARNING!

You or others could be injured if you leave the vehicle unattended without having the parking brake fully applied. The parking brake should always be applied when the driver is not in the vehicle, especially on an incline.

CAUTION!

Never drive with your foot resting on the clutch pedal, or attempt to hold the vehicle on a hill with the clutch pedal partially engaged, as this will cause abnormal wear on the clutch.

Truck models with manual transmission are equipped with a clutch interlocking ignition system. The clutch pedal must be fully depressed to start the vehicle.

Fully depress the clutch pedal before shifting gears. As you release the clutch pedal, lightly depress the accelerator pedal.

Shifting

Truck models with manual transmission are equipped with a clutch interlocking ignition system. The clutch pedal must be fully depressed to start the vehicle.

Fully depress the clutch pedal before shifting gears. As you release the clutch pedal, lightly depress the accelerator pedal.

This transmission has a "creeper" 1st gear (L=low) which should be used to start from a standing position when carrying a payload or towing a trailer. Damage to the clutch can result from starting in 2nd or 3rd gear with a loaded vehicle. An unloaded vehicle may be launched in 2nd gear. Use each gear in numerical order – do not skip a gear.

You should use 1st gear when starting from a standing position if under heavy load or when pulling a trailer.

Recommended Vehicle Shift Speeds

To utilize your manual transmission efficiently for both fuel economy and performance, it should be upshifted as listed in recommended shift speed chart. Shift at the vehicle speeds listed for acceleration. Earlier upshifts during cruise conditions (steady speeds) will result in increased fuel economy, and may be used as indicated.

6 Speed Manual Transmission Shift Speeds

Engine	L to 2	2 to 3	3 to 4	4 to 5	5 to 6
6.7L Turbo Diesel Engine	7 mph (11 km/h)	15 mph (24 km/h)	25 mph (40 km/h)	40 mph (64 km/h)	45 mph (72 km/h)

Downshifting

Moving from a high gear down to a lower gear is recommended to preserve brakes when driving down steep hills. In addition, downshifting at the right time provides better acceleration when you desire to resume speed. Downshift progressively. Do not skip gears to avoid overspeeding the engine and clutch. For acceleration at speeds less than 15 mph (25 km/h), 2nd gear is recommended.

WARNING!

Do not downshift for additional engine braking on a slippery surface. The drive wheels could lose their grip and the vehicle could skid.

CAUTION!

When descending a hill, be very careful to downshift one gear at a time to prevent overspeeding the engine which can cause valve damage, and / or clutch disc damage even if the clutch pedal is depressed.

CAUTION!

Failure to follow the recommended downshifting speeds may cause the engine to over speed and / or damage the clutch disc even if the clutch pedal is depressed.

Maximum Recommended Downshifting Speeds

Gear Selection	6 to 5	5 to 4	4 to 3	3 to 2	2 to L
Maximum Speed	68 mph (109 km/h)	50 mph (80 km/h)	32 mph (51 km/h)	19 mph (31 km/h)	10 mph (16 km/h)

Reverse Shifting

To shift into REVERSE, bring the vehicle to a complete stop. Depress the clutch and pause briefly to allow the gear train to stop rotating. Beginning from the NEUTRAL position, move the shift lever in one quick smooth motion straight across and into the REVERSE area (the driver will feel a firm "click" as the shifter passes the "knock-over"). Complete the shift by pulling the shift lever into REVERSE.

The "knock-over" prevents the driver from accidentally entering the REVERSE shift area and warns the driver that they are about to shift the transmission into REVERSE. Due to this feature, a slow shift to REVERSE can be perceived as a high shift effort.

To shift out of REVERSE bring the vehicle to a complete stop and depress the clutch. Shifting out of REVERSE prior to a complete stop may cause high shift effort.

FOUR-WHEEL DRIVE OPERATION – IF EQUIPPED

Four-wheel drive trucks are equipped with either a Manually Shifted transfer case or an electronically shifted transfer case. Refer to the operating instructions for your transfer case, located in this section.

Manually Shifted Transfer Case Operating Information/Precautions

The transfer case provides four mode positions - 2 (rear) wheel drive high range, 4-wheel drive high range, neutral, and 4-wheel drive low range.

This transfer case is intended to be driven in the 2-wheel drive position (2H) for normal street and highway conditions such as dry, hard surfaced roads.

When additional traction is required, the transfer case 4H and 4L positions can be used to lock the front and rear driveshafts together and force the front and rear wheels to rotate at the same speed. This is accomplished by simply moving the shift lever to the desired positions. The 4H and 4L positions are intended for loose, slippery road surfaces only. Driving in the 4H and 4L positions on dry, hard surfaced roads may cause increased tire wear and damage to the driveline components.

The 4-wheel drive light (4WD), located in the instrument cluster, alerts the driver that the vehicle is in 4-wheel drive and that the front and rear driveshafts are locked together. This light illuminates when the transfer case is shifted to either the 4H or 4L positions. There is no light for the 2H or NEUTRAL positions.

When operating your vehicle in 4L, the engine speed is approximately three times that of the 2H or 4H positions at a given road speed. Take care not to overspeed the engine and do not exceed 25 mph (40 km/h).

Proper operation of 4-wheel drive vehicles depends on tires of equal size, type and circumference on each wheel. Any difference will adversely affect shifting and can cause damage to the transfer case.

NOTE: Do not attempt to make a shift while only the front or rear wheels are spinning. The transfer case is not equipped with a synchronizer and therefore the front and rear driveshaft speeds must be equal for the shift to take place. Shifting while only the front or rear wheels are spinning can cause damage to the transfer case.

Because 4-wheel drive provides improved traction, there is a tendency to exceed safe turning and stopping speeds. Do not go faster than road conditions permit.

NOTE: Delayed shifts out of 4-wheel drive may be experienced due to uneven tire wear, low or uneven tire pressures, excessive vehicle loading, or cold temperatures.

WARNING!

You or others could be injured if you leave the vehicle unattended with the transfer case in the NEUTRAL position without first fully engaging the parking brake. The transfer case NEUTRAL position disengages both the front and rear driveshafts from the powertrain and will allow the vehicle to move regardless of the transmission position. The parking brake should always be applied when the driver is not in the vehicle.

For additional information on the appropriate use of each transfer case mode position see the information below:

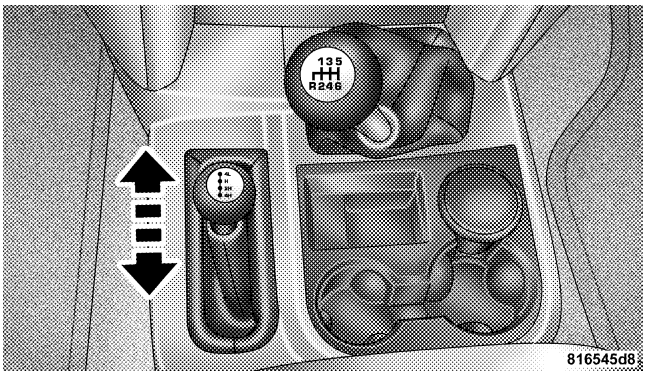
2H
Rear Wheel Drive High Range - Normal street and highway driving. Dry, hard surfaced roads.

4H
Four-Wheel Drive High Range - Locks the front and rear driveshafts together. Forces the front and rear wheels to rotate at the same speed. Additional traction for loose, slippery road surfaces only.

N
NEUTRAL - Disengages both the front and rear driveshafts from the powertrain. To be used for flat towing behind another vehicle. Refer to "Recreational Towing" in this section.

4L
Four-Wheel Drive Low Range - Low speed 4-wheel drive. Locks the front and rear driveshafts together. Forces the front and rear wheels to rotate at the same speed. Additional traction and maximum pulling power for loose, slippery road surfaces only. Do not exceed 25 mph (40 km/h). **Vehicles equipped with the AISIN (AS68RC) Automatic Transmission, Overdrive gear (5th and 6th) will be disabled when the transfer case is in 4L.**

Shifting Procedure – Manually Shifted Transfer Case



Manual Transfer Case Shifter

2H ⇔ 4H

Shifting between 2H and 4H can be made with the vehicle stopped or in motion. If the vehicle is in motion, shifts can be made up to 55 mph (88 km/h). With the vehicle in motion, the transfer case will engage/disengage faster if you momentarily release the accelerator pedal after completing the shift. Apply a constant force when shifting the transfer case lever.

2H or 4H ⇔ 4L

With the vehicle rolling at 2 to 3 mph (3 to 5 km/h), shift an automatic transmission to NEUTRAL or depress the clutch on a manual transmission. While the vehicle is coasting at 2 to 3 mph (3 to 5 km/h), shift the transfer case lever firmly to the desired position. Do not pause in transfer case NEUTRAL.

NOTE: Pausing in transfer case NEUTRAL in vehicles equipped with an automatic transmission may require shutting the engine OFF to avoid gear clash while completing the shift. If difficulty occurs, shift automatic transmission to NEUTRAL, hold foot on brake, and turn engine OFF. Make shift to the desired mode.

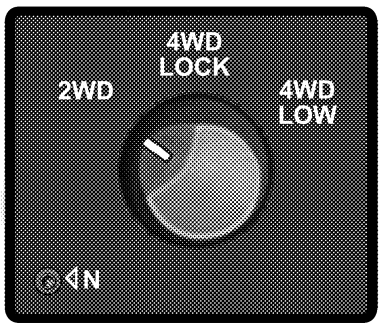
NOTE: Shifting into or out of 4L is possible with the vehicle completely stopped, however difficulty may occur due to the mating clutch teeth not being properly aligned. Several attempts may be required for clutch teeth alignment and shift completion to occur. The preferred method is with the vehicle rolling 2 to 3 mph (3 to 5 km/h). Avoid attempting to engage or disengage 4L with the vehicle moving faster than 2 to 3 mph (3 to 5 km/h).

NOTE: Do not attempt to shift to or from 4L while the transmission is in gear or clutch is engaged.

Transfer Case Reminder Light

The 4-wheel drive operating light (4WD), located in the instrument cluster, is used to alert the driver that the front axle is fully engaged and all four wheels are driving.

Electronically Shifted Transfer Case Operating Information/Precautions (4 Position Switch) – If Equipped



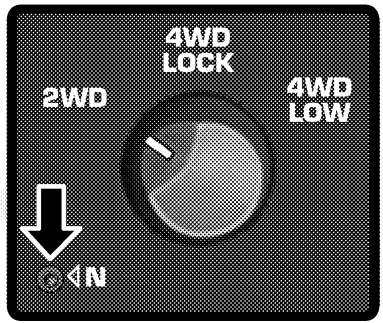
Transfer Case Switch

This is an electric shift transfer case and is operated by the 4WD Control Switch (Transfer Case Switch), which is located on the instrument panel.

This Electronically Shifted transfer case provides four mode positions: 2 (rear)-wheel drive high range, 4-wheel drive lock range, 4-wheel drive low range, and NEUTRAL.

The Electronically Shifted transfer case is designed to be driven in the 2-wheel drive position (2WD) for normal street and highway conditions (dry, hard surfaced roads).

When additional traction is required, the transfer case 4WD LOCK and 4WD LOW positions can be used to lock the front and rear driveshafts together and force the front and rear wheels to rotate at the same speed. This is accomplished by rotating the 4WD Control Switch to the desired position - refer to "Shifting Procedure" in this section. The 4WD LOCK and 4WD LOW positions are designed for loose, slippery road surfaces only. Driving in the 4WD LOCK and 4WD LOW positions on dry hard surfaced roads may cause increased tire wear and damage to the driveline components.



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NOTE: The transfer case NEUTRAL position is selected by depressing the recessed button located on the lower left hand corner of the 4WD Control Switch. The transfer case NEUTRAL position is to be used for recreational towing only. Refer to "Recreational Towing" in this section.

Transfer Case Position Indicator Lights — Electronically Shifted Transfer Case Only

Transfer case position indicator lights are located in the instrument cluster and indicate the current and desired transfer case selection. When you select a different transfer case position, the indicator lights will do the following:

If All Shift Conditions Are Met:

1. The current position indicator light will turn OFF.

2. The selected position indicator light will flash until the transfer case completes the shift.

3. When the shift is complete, the indicator light for the selected position will stop flashing and remain ON.

If One or More Shift Conditions Are Not Met:

1. The indicator light for the current position will remain ON.

2. The newly selected position indicator light will continue to flash.

3. The transfer case **will not** shift.

NOTE: Before retrying a selection, make certain that all the necessary requirements for selecting a new transfer case position have been met. To retry the selection, turn the control knob back to the current position, wait five seconds, and retry selection. To find the shift requirements, refer to the ″Shifting Procedure″ for your transfer case, located in this section.

The “SERVICE 4WD” warning light monitors the electric shift 4WD system. If this light remains on after engine start up or illuminates during driving, it means that the 4WD system is not functioning properly and that service is required.

WARNING!

Always engage the parking brake when powering down the vehicle if the "SERVICE 4WD" light is illuminated. Not engaging the parking brake may allow the vehicle to roll, which may cause personal injury.

NOTE: Do not attempt to make a shift while only the front or rear wheels are spinning, as this can cause damage to driveline components.

When operating your vehicle in 4WD LOW, the engine speed is approximately three times that of the 2WD or 4WD LOCK positions at a given road speed. Take care not to overspeed the engine and do not exceed 25 mph (40 km/h).

Proper operation of 4-wheel drive vehicles depends on tires of equal size, type and circumference on each wheel. Any difference in tire size can cause damage to the transfer case.

Because 4-wheel drive provides improved traction, there is a tendency to exceed safe turning and stopping speeds. Do not go faster than road conditions permit.

WARNING!

You or others could be injured if you leave the vehicle unattended with the transfer case in the NEUTRAL position without first fully engaging the parking brake. The transfer case NEUTRAL position disengages both the front and rear driveshafts from the powertrain and will allow the vehicle to move regardless of the transmission position. The parking brake should always be applied when the driver is not in the vehicle.

For additional information on the appropriate use of each transfer case mode position see the information below:

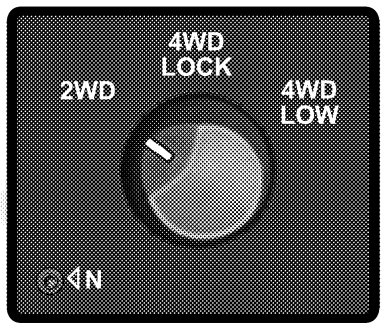
2WD
Rear Wheel Drive High Range - Normal street and highway driving. Dry, hard surfaced roads.

4WD LOCK
4-Wheel Drive Lock Range - Locks the front and rear driveshafts together. Forces the front and rear wheels to rotate at the same speed. Additional traction for loose, slippery road surfaces only.

4WD LOW
4-Wheel Drive Low Range - Low speed 4-wheel drive. Locks the front and rear driveshafts together. Forces the front and rear wheels to rotate at the same speed. Additional traction and maximum pulling power for loose, slippery road surfaces only. Do not exceed 25 mph (40 km/h).

N
Neutral - Disengages both the front and rear driveshafts from the powertrain. To be used for flat towing behind another vehicle. Refer to “Recreational Towing” in this section.

Shifting Procedure – Electronically Shifted Transfer Case



Transfer Case Switch

NOTE: If any of the requirements to select a new transfer case position have not been met, the transfer case will not shift. The indicator light for the previous position will remain ON and the newly selected position indicator light will continue to flash until all the requirements for the selected position have been met. To retry a shift: return the control knob back to the original position, make certain all shift requirements have been met, wait five seconds and try the shift again.

NOTE: If all the requirements to select a new transfer case position have been met, the current position indicator light will turn OFF, the selected position indicator light will flash until the transfer case completes the shift. When the shift is complete, the indicator light for the selected position will stop flashing and remain ON.

2WD⇔ 4WD LOCK

Rotate the 4WD control switch to the desired position. Shifts between 2WD and 4WD LOCK can be done with the vehicle stopped or in motion. With the vehicle in motion, the transfer case will engage/disengage faster if you momentarily release the accelerator pedal after turning the control switch. If the vehicle is stopped, the

ignition key must be in the ON position with the engine either running or off. This shift cannot be completed if the key is in the ACC position.

NOTE: The 4x4 system will not allow shifts between 2WD/4WD LOCK if the front and/or rear wheels are spinning (no traction). In this situation the selected position indicator light will flash and the original position indicator light will remain ON. At this time, reduce speed and stop spinning the wheels to complete the shift.

2WD or 4WD LOCK⇔ 4WD LOW

NOTE: When shifting into or out of 4WD LOW some gear noise may be heard. This noise is normal and is not detrimental to the vehicle or occupants.

Shifting can be performed with the vehicle rolling 2 to 3 mph (3 to 5 km/h) or completely stopped. USE EITHER OF THE FOLLOWING PROCEDURES:

Preferred Procedure

1. With engine running, slow vehicle to 2 to 3 mph (3 to 5 km/h).

2. Shift the transmission into NEUTRAL (depress clutch on manual transmissions).

3. While still rolling, rotate the transfer case control switch to the desired position.

4. After the desired position indicator light is ON (not flashing), shift transmission back into gear (release clutch on manual transmissions).

Alternate Procedure

1. Bring the vehicle to complete stop.

2. With the key ON and the engine either OFF or running, shift the transmission into NEUTRAL (depress clutch on manual transmissions).

3. Rotate the transfer case control switch to the desired position.

4. After the desired position indicator light is ON (not flashing), shift transmission back into gear (release clutch on manual transmissions).

NOTE: If steps 1 or 2 of either the Preferred or Alternate Procedure are not satisfied prior to attempting the shift then the desired position indicator light will flash continuously while the original position indicator light is ON, until all requirements have been met.

NOTE: The ignition key must be ON for a shift to take place and for the position indicator lights to be operable. If the key is not ON then the shift will not take place and no position indicator lights will be on or flashing.

NOTE: If your are leaving your vehicle stored for longer than 21 days, refer to "Vehicle Storage" in section 7.

LIMITED-SLIP DIFFERENTIAL – IF EQUIPPED

The limited-slip differential provides additional traction on snow, ice, mud, sand and gravel, particularly when there is a difference between the traction characteristics of the surface under the right and left rear wheels. During normal driving and cornering, the limited-slip unit performs similarly to a conventional differential. On slippery surfaces, however, the differential delivers more of the driving effort to the rear wheel having the better traction.

The limited-slip differential is especially helpful during slippery driving conditions. With both rear wheels on a slippery surface, a slight application of the accelerator will supply maximum traction. When starting with only one rear wheel on an excessively slippery surface, slight momentary application of the parking brake may be necessary to gain maximum traction.

WARNING!

On vehicles equipped with a limited-slip differential, never run the engine with one rear wheel off the ground, since the vehicle may drive through the rear wheel remaining on the ground. You could lose control of the vehicle.

Care should be taken to avoid sudden accelerations when both rear wheels are on a slippery surface. This could cause both rear wheels to spin, and allow the vehicle to slide sideways on the crowned surface of a road or in a turn.

POWER TAKE OFF OPERATION – IF EQUIPPED

This vehicle, when equipped with either the automatic 6 speed or manual G-56 6 speed transmissions, will allow for an aftermarket upfit with a transmission driven PTO (power take off). The customer will have the ability to operate the PTO in either a "stationary" or "mobile" mode. The vehicles will be factory set to the "stationary" mode. In order to select the "mobile" mode an authorized Dealership is required to modify the vehicle's settings using their proprietary authorized Dealer service tool.

Stationary Mode

To operate the PTO in this mode the vehicle must meet the following conditions:

- Be in PARK position (vehicles equipped with automatic transmission)
- Upfitter provider (on/off) switch has been activated

- Parking brake applied (vehicles equipped with manual transmission)
- Vehicle must be running
- No vehicle, brake or clutch switch faults present
- PTO must be correctly installed using the vehicle provided circuits

The customer has the choice to operate the PTO by utilizing the cruise control switches or by utilizing a remote control (provided by the PTO supplier). To operate the feature using the cruise control switches, the customer must first activate the upfitter-provided on/off switch. Next, the cruise control ON switch is selected. Following this step the SET switch must be depressed. The vehicle is now in the PTO mode and is ready for use. In order to increase or decrease the engine idle speed, to optimize the PTO function, the RESUME/ACCEL and DECEL cruise switches can be used respectively. To disengage PTO operation and return to "standard vehicle operation" simply turn the upfitter-provided on/off switch to the OFF position or press the CANCEL cruise switch.

To operate the PTO via a remote switch the customer must make sure the above conditions are met. It is vital for proper operation that the PTO and remote have been installed correctly, paying special attention to ensure the vehicle provided wiring has been connected properly. This is the responsibility of the installer of the PTO and switches/remote system. It is the responsibility of the PTO manufacturer to ensure that their electrical (switches and remote) system is compatible with the vehicle's electrical architecture and software functionality.

Mobile Mode

To operate the PTO in this mode the vehicle must meet the following conditions:

- Authorized Dealer-selected "mobile" mode activated via authorized Dealer proprietary service tool
- Upfitter-provided (on/off) switch has been activated
- Vehicle must be in PARK or DRIVE position (vehicles equipped with automatic transmission)
- Parking brake must not be applied
- No vehicle, brake or clutch switch faults present
- Vehicle must be running
- PTO must be correctly installed using the vehicle provided circuits

The customer may choose to use the PTO while the vehicle is moving. To do so, the PTO function must be activated prior to taking the vehicle out of PARK. This is accomplished by activating the upfitter-provided PTO on/off switch. At this point, the customer may place the vehicle in a forward or reverse gear and have PTO operation. To disengage PTO operation and return to "standard vehicle operation" simply turn the upfitter-provided on/off switch to the OFF position.

NOTE: For application specific information with respect to PTO and pump requirements and additional vehicle information (wiring schematics, preset idle values, engine speed limits, and vehicle hardware and software requirements) please refer to the Sterling Bullet Body Builders Guide by accessing **"www.SterlingTrucks.com"** and choosing the appropriate links, or by calling the Sterling Body Builder line, 1–503–745–6822.

DRIVING ON SLIPPERY SURFACES

When driving on wet or slushy roads, it is possible for a wedge of water to build up between the tire and road surface. This is known as hydroplaning and may cause partial or complete loss of vehicle control and stopping ability. To reduce this possibility, the following precautions should be observed:

1. Slow down during rainstorms or when roads are slushy.

2. Slow down if road has standing water or puddles.

3. Replace tires when tread wear indicators first become visible.

4. Keep tires properly inflated.

5. Maintain sufficient distance between your vehicle and the vehicle in front to avoid a collision in a sudden stop.

6. Do not use trailer tow mode on vehicles with the AISIN 6 speed automatic transmission (6.7L Diesel Engine only).

DRIVING THROUGH WATER

Driving through water more than a few inches/ centimeters deep will require extra caution to ensure safety and prevent damage to your vehicle.

Flowing/Rising Water

WARNING!

Do not drive on, or cross, a road or a path where water is flowing and/or rising (as in storm run-off). Flowing water can wear away the road or path's surface and cause your vehicle to sink into deeper water. Furthermore, flowing and/or rising water can carry your vehicle away swiftly. Failure to follow this warning may result in injuries that are serious or fatal to you, your passengers, and others around you.

Shallow Standing Water

Although your vehicle is capable of driving through shallow standing water, consider the following Caution and Warning before doing so.

CAUTION!

- **Always check the depth of the standing water before driving through it. Never drive through standing water that is deeper than the bottom of the tire rims mounted on the vehicle.**
- **Determine the condition of the road or the path that is under water, and if there are any obstacles in the way, before driving through the standing water.**
- **Do not exceed 5 mph (8 km/h) when driving through standing water. This will minimize wave effects.**

CAUTION!

- **Driving through standing water may cause damage to your vehicle's drivetrain components. Always inspect your vehicle's fluids (i.e., engine oil, transmission, axle, etc.) for signs of contamination (i.e., fluid that is milky or foamy in appearance) after driving through standing water. Do not continue to operate the vehicle if any fluid appears contaminated, as this may result in further damage. Such damage is not covered by the New Vehicle Limited Warranty.**
- **Getting water inside your vehicle's engine can cause it to lock up and stall out, and cause serious internal damage to the engine. Such damage is not covered by the New Vehicle Limited Warranty.**

WARNING!

- **Driving through standing water limits your vehicle's traction capabilities. Do not exceed 5 mph (8 km/h) when driving through standing water.**
- **Driving through standing water limits your vehicle's braking capabilities, which increases stopping distances. Therefore, after driving through standing water, drive slowly and lightly press on the brake pedal several times to dry the brakes.**
- **Getting water inside your vehicle's engine can cause it to lock up and stall out, and leave you stranded.**
- **Failure to follow these warnings may result in injuries that are serious or fatal to you, your passengers, and others around you.**

DRIVING OFF-ROAD

Care should be taken when attempting to climb steep hills or driving diagonally across a hill or slope. If natural obstacles force you to travel diagonally up or down a hill, choose a mild angle and keep as little side tilt as possible. Keep the vehicle moving and make turns slowly and cautiously.

If you must back down a hill, back straight down using REVERSE gear. Never back down in NEUTRAL, or diagonally across the hill.

When driving over sand, mud, and other soft terrain, shift to low gear and drive steadily. Apply the accelerator slowly to avoid spinning the wheels.

DO NOT REDUCE the tire pressures for this type of driving.

NOTE: After off-road usage, particularly in sand or mud, inspect the underside of the vehicle for accumulated dirt at the propeller shaft, axles, U-joints, brake rotors and calipers.

Use a hose to clean off any accumulation of dirt or mud.

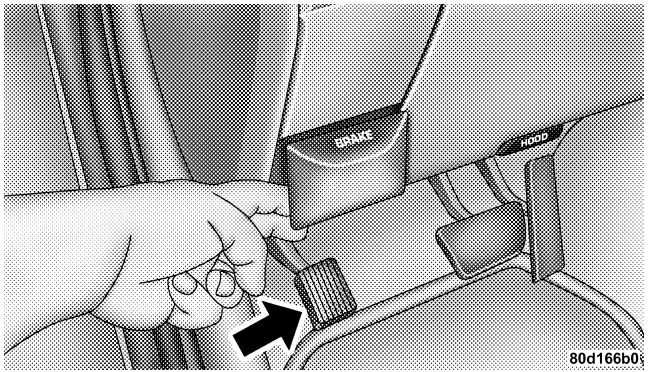
Check the exhaust system and all exposed components for any sign of damage.

If you experience unusual vibration after driving in mud, slush or similar conditions, check the wheels for impacted material. Impacted foreign material can cause a wheel imbalance. Removing the foreign material from the wheels will correct the situation.

PARKING BRAKE

The foot-operated parking brake is positioned below the lower left corner of the instrument panel. To release the parking brake, pull the parking brake release handle.

NOTE: The instrument cluster red brake warning light will come on and flash to indicate that the parking brake is applied. You must be sure that the parking brake is fully applied before leaving the vehicle.



Parking Brake Release

Be sure the parking brake is firmly set when parked and the shift lever is in the PARK position. When parking on a hill you should apply the parking brake before placing the shift lever in PARK, otherwise the load on the transmission locking mechanism may make it difficult to move the shift lever out of PARK.

WARNING!

- **Always fully apply the parking brake when leaving your vehicle, or it may roll and cause damage or injury. Also be certain to leave an automatic transmission in PARK, a manual transmission in REVERSE or FIRST gear. Failure to do so may allow the vehicle to roll and cause damage or injury.**
- **Never leave children alone in a vehicle. Leaving unattended children in a vehicle is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Don't leave the key in the ignition. A child could operate power windows, other controls, or move the vehicle.**
- **Be sure the parking brake is fully disengaged before driving, failure to do so can lead to brake problems due to excessive heating of the rear brakes.**

When parking on a hill, turn the front wheels toward the curb on a downhill grade and away from the curb on an uphill grade.

The parking brake should always be applied whenever the driver is not in the vehicle.

BRAKE SYSTEM

If power assist is lost for any reason (for example, repeated brake applications with the engine off), the brakes will still function. However, you will experience a substantial increase in braking effort to stop the vehicle.

If either the front or rear hydraulic systems lose normal capability, the remaining system will still function with some loss of overall braking effectiveness. This will be evident by increased pedal travel during application, greater pedal force required to slow or stop, and activation of the BRAKE warning light and the ABS light (if equipped) during brake use.

Brake Noise

During normal operation of the brake system certain noises may be present from time to time. Occasional ″groan″ or ″squeal″ noises may occur during normal operation of the brake system which may not be indicative of a problem. These noises may be heard at any time the brakes are applied but may be more noticeable during the first few brake applications in the morning. Moisture, hot or cold temperature, dust, and or other debris may also contribute to the noise condition. Repeated or continuous noises during braking may be an indication that the brake linings are worn and in need of replacement.

Four-Wheel Anti-Lock Brake System

WARNING!

Anti-Lock Brake Systems contain sophisticated electronic equipment. It may be susceptible to interference caused by improperly installed or high output radio transmitting equipment. This interference can cause possible loss of anti-lock braking capability. Installation of such equipment should be performed by qualified professionals.

WARNING!

- **Anti-lock Brake System (ABS) cannot prevent the natural laws of physics from acting on the vehicle, nor can it increase braking or steering efficiency beyond that afforded by the condition of the vehicle brakes and tires or the traction afforded.**
- **The ABS cannot prevent accidents, including those resulting from excessive speed in turns, following another vehicle too closely, or hydroplaning. Only a safe, attentive, and skillful driver can prevent accidents.**
- **The capabilities of an ABS equipped vehicle must never be exploited in a reckless or dangerous manner which could jeopardize the user's safety or the safety of others.**

This Anti-lock Brake System is designed to aid the driver in maintaining vehicle control under adverse braking conditions. The system operates with a separate computer to modulate hydraulic pressure to prevent wheel lockup and help avoid skidding on slippery surfaces.

The system's pump motor runs during an ABS stop to provide regulated hydraulic pressure. The pump motor makes a low humming noise during operation. This is normal.

When you are in a severe braking condition involving use of the Anti-lock Brake System, you will experience some pedal drop as the vehicle comes to a complete stop. This is the result of the system reverting to the base brake system and is normal.

Engagement of the Anti-lock Brake System may be accompanied by a pulsing sensation in the brake pedal. You may also hear a clicking noise. These occurrences are normal, and indicate that the system is functioning.

ABS Warning Light

The Anti-lock Brake System includes an amber warning light, located in the instrument cluster. When the light is illuminated, the Anti-lock Brake System is not functioning. The system reverts to standard non-anti-lock brakes.

WARNING!

Pumping of the anti-lock brakes will diminish their effectiveness and may lead to an accident. Pumping makes the stopping distance longer. Just press firmly on your brake pedal when you need to slow down or stop.

POWER STEERING

The standard power steering system will give you good vehicle response and increased ease of maneuverability in tight spaces. The system will provide mechanical steering capability if power assist is lost.

If for some reason the power assist is interrupted, it will still be possible to steer your vehicle. Under these conditions you will observe a substantial increase in steering effort, especially at very low vehicle speeds and during parking maneuvers.

NOTE: Increased noise levels at the end of the steering wheel travel are considered normal and does not indicate that there is a problem with the power steering system.

Upon initial start-up in cold weather, the power steering pump may make noise for a short period of time. This is due to the cold, thick fluid in the steering system. This noise should be considered normal, and does not in any way damage the steering system.

WARNING!

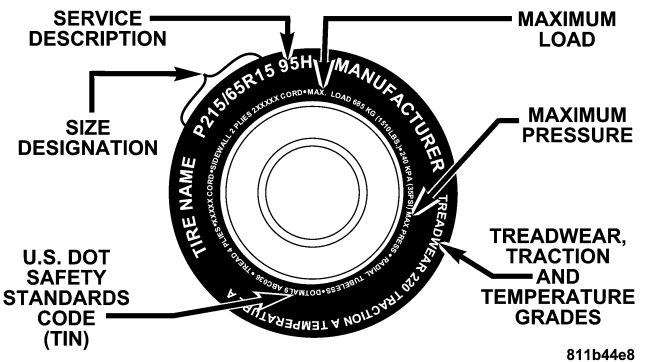
Continued operation with reduced power steering assist could pose a safety risk to yourself and others. Service should be obtained as soon as possible.

CAUTION!

Prolonged operation of the steering system at the end of the steering wheel travel will increase the steering fluid temperature and should be avoided when possible. Damage to the power steering pump may occur.

TIRE SAFETY INFORMATION

TIRE MARKINGS



NOTE:

- P (Passenger) - Metric tire sizing is based on U.S. design standards. P-Metric tires have the letter "P" molded into the sidewall preceding the size designation. Example: P215/65R15 95H.

- European-Metric tire sizing is based on European design standards. Tires designed to this standard have the tire size molded into the sidewall beginning with the section width. The letter ″P″ is absent from this tire size designation. Example: 215/65R15 96H.
- LT (Light Truck) - Metric tire sizing is based on U.S. design standards. The size designation for LT-Metric tires is the same as for P-Metric tires except for the letters “LT” that are molded into the sidewall preceding the size designation. Example: LT235/85R16.
- Temporary spare tires are high-pressure compact spares designed for temporary emergency use only. Tires designed to this standard have the letter “T” molded into the sidewall preceding the size designation. Example: T145/80D18 103M.
- High flotation tire sizing is based on U.S. design standards, and it begins with the tire diameter molded into the sidewall. Example: 31x10.5 R15 LT.

Tire Sizing Chart

TIRE SIZING TERMS
Size Designation:
P = Passenger Car tire size based on U.S. design standards **"....blank...."** = Passenger Car tire based on European design standards **LT** = Light Truck tire based on U.S. design standards **T** = Temporary spare tire **31** = Overall diameter in inches (in)
215 = Section width in millimeters (mm)
65 = Aspect ratio in percent (%) — Ratio of section height to section width of tire **10.5** = Section width in inches (in)
R = Construction code — "R" means radial construction —"D" means diagonal or bias construction
15 = Rim diameter in inches (in)

TIRE SIZING TERMS
Service Description:
95 = Load Index — A numerical code associated with the maximum load a tire can carry
H = Speed Symbol — A symbol indicating the range of speeds at which a tire can carry a load corresponding to its load index under certain operating conditions — The maximum speed corresponding to the speed symbol should only be achieved under specified operating conditions (i.e., tire pressure, vehicle loading, road conditions, and posted speed limits)
Load Identification:
"....blank...." = Absence of any text on the sidewall of the tire indicates a Standard Load (SL) Tire
Extra Load (XL) = Extra load (or reinforced) tire
Light Load = Light load tire
C, D, E = Load range associated with the maximum load a tire can carry at a specified pressure
Maximum Load — Maximum load indicates the maximum load this tire is designed to carry
Maximum Pressure — Maximum pressure indicates the maximum permissible cold tire inflation pressure for this tire

TIRE IDENTIFICATION NUMBER (TIN)

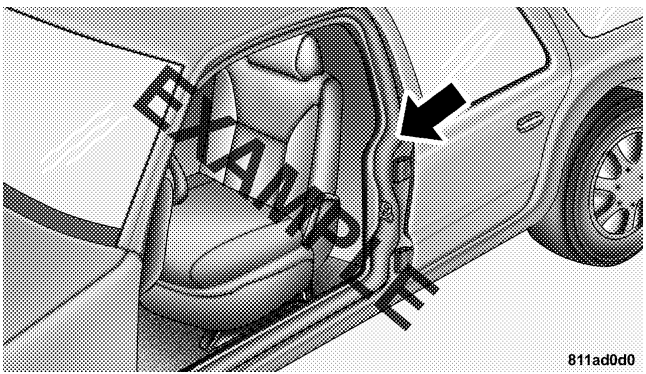
The TIN may be found on one or both sides of the tire, however, the date code may only be on one side. Tires with white sidewalls will have the full TIN, including the date code, located on the white sidewall side of the tire. Look for the TIN on the outboard side of black sidewall tires as mounted on the vehicle. If the TIN is not found on the outboard side, then you will find it on the inboard side of the tire.

TIRE IDENTIFICATION NUMBER
EXAMPLE: DOT MA L9 ABCD 0301
DOT = Department of Transportation — This symbol certifies that the tire is in compliance with the U.S. Department of Transportation tire safety standards, and is approved for highway use
MA = Code representing the tire manufacturing location (two digits)
L9 = Code representing the tire size (two digits)
ABCD = Code used by the tire manufacturer (one to four digits)
03 = Number representing the week in which the tire was manufactured (two digits) —03 means the 3rd week.
01 = Number representing the year in which the tire was manufactured (two digits) —01 means the year 2001 — Prior to July 2000, tire manufacturers were only required to have one number to represent the year in which the tire was manufactured. Example: 031 could represent the 3rd week of 1981 or 1991

TIRE LOADING AND TIRE PRESSURE

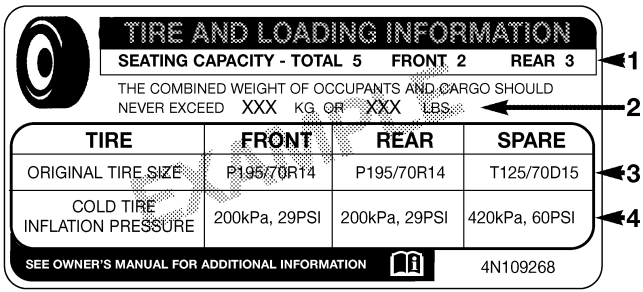
Tire Placard Location

NOTE: The proper cold tire inflation pressure is listed on either the face of the driver's door or the driver's side B-Pillar.



Tire Placard Location

Tire and Loading Information Placard



Tire And Loading Information Placard

This placard tells you important information about the:

1) number of people that can be carried in the vehicle

2) total weight your vehicle can carry

3) tire size designed for your vehicle

4) cold tire inflation pressures for the front, rear, and spare tires.

Loading

The vehicle maximum load on the tire must not exceed the load carrying capacity of the tire on your vehicle. You will not exceed the tire's load carrying capacity if you adhere to the loading conditions, tire size, and cold tire inflation pressures specified on the Tire and Loading Information placard and in the "Vehicle Loading" section of this manual.

NOTE: Under a maximum loaded vehicle condition, gross axle weight ratings (GAWRs) for the front and rear axles must not be exceeded. For further information on GAWRs, vehicle loading, and trailer towing, refer to "Vehicle Loading" in this section.

To determine the maximum loading conditions of your vehicle, locate the statement "The combined weight of occupants and cargo should never exceed XXX kg or XXX lbs." on the Tire and Loading Information placard. The combined weight of occupants, cargo/luggage and trailer tongue weight (if applicable) should never exceed the weight referenced here.

Steps for Determining Correct Load Limit

1. Locate the statement "The combined weight of occupants and cargo should never exceed XXX kg or XXX lbs" on your vehicle's placard.

2. Determine the combined weight of the driver and passengers that will be riding in your vehicle.

3. Subtract the combined weight of the driver and passengers from XXX kg or XXX lbs.

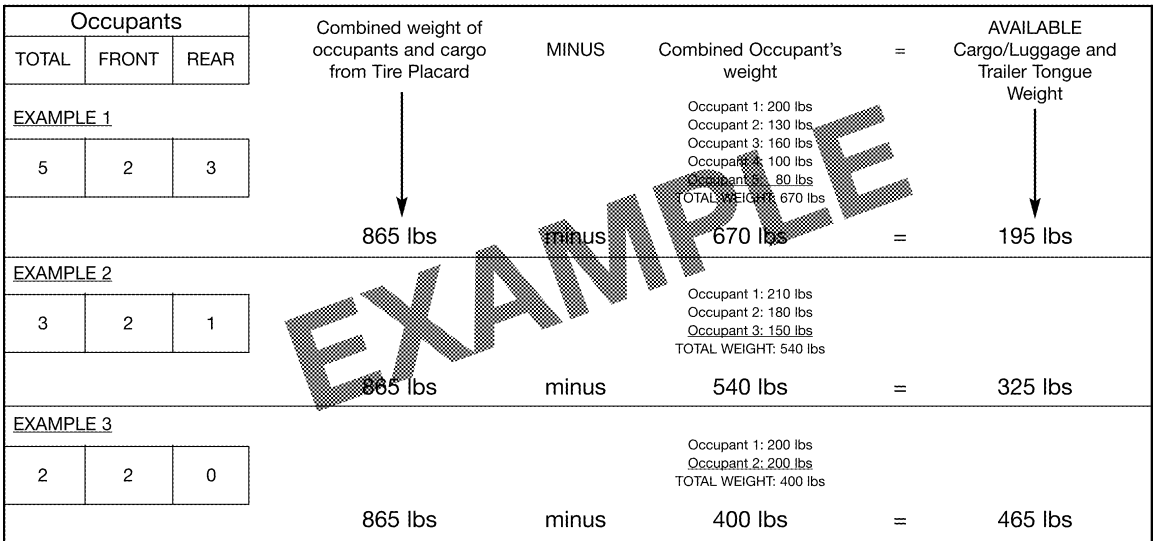
4. The resulting figure equals the available amount of cargo and luggage load capacity. For example, if "XXX" amount equals 1,400 lbs (635 kg) and there will be five 150 lb (68 kg) passengers in your vehicle, the amount of available cargo and luggage load capacity is 650 lbs (295 kg) (since 5 x 150 = 750, and 1400 – 750 = 650 lbs [295 kg]).

5. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity calculated in Step 4.

6. If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult this manual to determine how this reduces the available cargo and luggage load capacity of your vehicle.

NOTE: The following table shows examples on how to calculate total load, cargo/luggage, and towing capacities of your vehicle with varying seating configurations and number and size of occupants. This table is for illustration purposes only and may not be accurate for the seating and load carry capacity of your vehicle.

NOTE: For the following example, the combined weight of occupants and cargo should never exceed 865 lbs (392 kg).


Occupants
TOTAL
FRONT
REAR
Combined weight of occupants and cargo from Tire Placard
MINUS
Combined Occupant's weight
=
AVAILABLE Cargo/Luggage and Trailer Tongue Weight
EXAMPLE 1
5
2
3
Occupant 1: 200 lbs
Occupant 2: 130 lbs
Occupant 3: 160 lbs
Occupant 4: 100 lbs
Occupant 5: 80 lbs
TOTAL WEIGHT: 670 lbs
865 lbs
minus
670 lbs
=
195 lbs
EXAMPLE 2
3
2
1
Occupant 1: 210 lbs
Occupant 2: 180 lbs
Occupant 3: 150 lbs
TOTAL WEIGHT: 540 lbs
865 lbs
minus
540 lbs
=
325 lbs
EXAMPLE 3
2
2
0
Occupant 1: 200 lbs
Occupant 2: 200 lbs
TOTAL WEIGHT: 400 lbs
865 lbs
minus
400 lbs
=
465 lbs
EXAMPLE

811a4d11

WARNING!

Overloading of your tires is dangerous. Overloading can cause tire failure, affect vehicle handling, and increase your stopping distance. Use tires of the recommended load capacity for your vehicle. Never overload them.

TIRES — GENERAL INFORMATION

Tire Pressure

Proper tire inflation pressure is essential to the safe and satisfactory operation of your vehicle. Three primary areas are affected by improper tire pressure:

1. Safety—

WARNING!

• Improperly inflated tires are dangerous and can cause accidents.

• Under-inflation increases tire flexing and can result in tire failure.

• Over-inflation reduces a tire's ability to cushion shock. Objects on the road and chuckholes can cause damage that result in tire failure.

• Unequal tire pressures can cause steering problems. You could lose control of your vehicle.

• Over-inflated or under-inflated tires can affect vehicle handling and can fail suddenly, resulting in loss of vehicle control.

• Unequal tire pressures from one side of the vehicle to the other can cause the vehicle to drift to the right or left.

• Always drive with each tire inflated to the recommended cold tire inflation pressure.

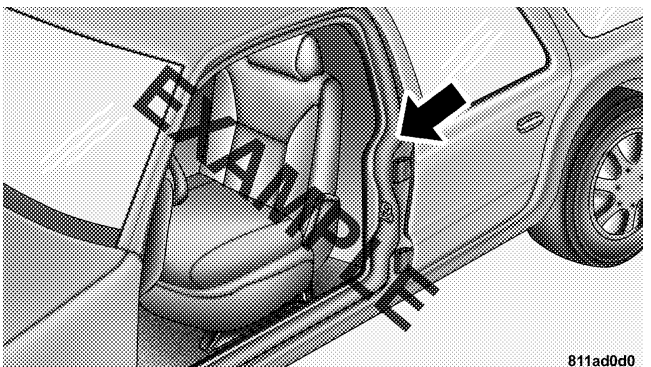
2. Economy—
Improper inflation pressures can cause uneven wear patterns to develop across the tire tread. These abnormal wear patterns will reduce tread life resulting in a need for earlier tire replacement. Under-inflation also increases tire rolling resistance and results in higher fuel consumption.

3. Ride Comfort and Vehicle Stability—
Proper tire inflation contributes to a comfortable ride. Over-inflation produces a jarring and uncomfortable ride.

Tire Inflation Pressures

The proper cold tire inflation pressure is listed either on the face of the driver's door or on the driver's side B-pillar.

Some vehicles may have Supplemental Tire Pressure Information for vehicle loads that are less than the maximum loaded vehicle condition. These pressure conditions will be found in the "Supplemental Tire Pressure Information" section of this manual.



Tire Placard Location

The pressure should be checked and adjusted as well as inspecting for signs of tire wear or visible damage at least once a month. Use a good quality pocket-type gauge to

check tire pressure. Do not make a visual judgement when determining proper inflation. Radial tires may look properly inflated even when they are under-inflated.

CAUTION!

After inspecting or adjusting the tire pressure, always reinstall the valve stem cap (if equipped). This will prevent moisture and dirt from entering the valve stem, which could damage the valve stem.

Inflation pressures specified on the placard are always "cold tire inflation pressure." Cold tire inflation pressure is defined as the tire pressure after the vehicle has not been driven for at least three hours, or driven less than 1 mi (1 km) after a three hour period. The cold tire inflation pressure must not exceed the maximum inflation pressure molded into the tire sidewall.

Check tire pressures more often if subject to a wide range of outdoor temperatures, as tire pressures vary with temperature changes.

Tire pressures change by approximately 1 psi (7 kPa) per 12°F (7°C) of air temperature change. Keep this in mind when checking tire pressure inside a garage, especially in the winter.

Example: If garage temperature = 68°F (20°C) and the outside temperature = 32°F (0°C) then the cold tire inflation pressure should be increased by 3 psi (21 kPa), which equals 1 psi (7 kPa) for every 12°F (7°C) for this outside temperature condition.

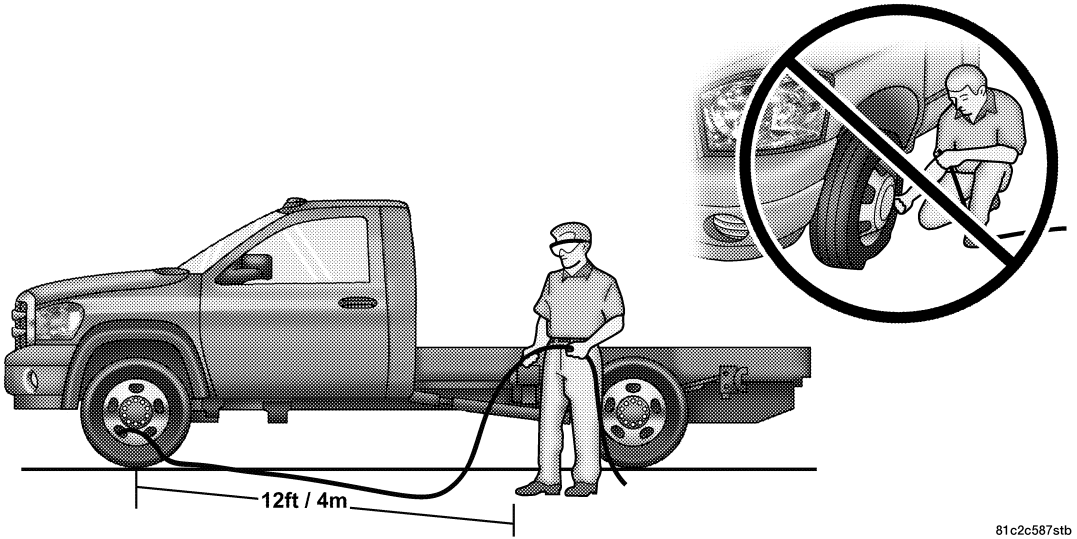
Tire pressure may increase from 2 to 6 psi (13 to 40 kPa) during operation. DO NOT reduce this normal pressure build up or your tire pressure will be too low.

Tire Inflation Pressure — 4500/5500 with Steel Carcass Ply Tires

This type of tire utilizes steel cords in the sidewall. As such, they cannot be treated like normal light truck tires. Adjusting tire pressure must be performed by personnel trained, supervised and equipped accordingly.

Inflation Pressure Adjustment When Mounted to Vehicle

During procedures when adding tire inflation pressure, the technician or individual must utilize a remote inflation device, and ensure that all persons are clear of the trajectory area. See figure following.



Sterling 4500/5500 Tire Inflation

When adjusting inflation pressure to a tire and wheel assembly mounted on a vehicle, use a Remote Mount Automatic Inflation Kit.

NOTE: Never attempt to re-inflate a tire and wheel assembly which has been run flat or is extremely under-inflated without first removing the tire from the wheel assembly for inspection.

Personnel trained, supervised, and equipped according to Federal Occupational Safety and Health Administration (OSHA) should perform this work.

Inflation Pressure Adjustment When Not Mounted to Vehicle

When adjusting inflation pressure to a tire and wheel assembly not mounted on a vehicle, use a Remote Mount Automatic Inflation Kit and a Tire Inflation Cage.

Tire Pressures for High Speed Operation

The manufacturer advocates driving at safe speeds within posted speed limits. Where speed limits or conditions are such that the vehicle can be driven at high speeds, maintaining correct tire inflation pressure is very important. Increased tire pressure and reduced vehicle loading may be required for high-speed vehicle operation. Refer to original equipment or an authorized tire dealer for recommended safe operating speeds, loading and cold tire inflation pressures.

WARNING!

High speed driving with your vehicle under maximum load is dangerous. The added strain on your tires could cause them to fail. You could have a serious accident resulting in serious injury or death. Don't drive a vehicle loaded to the maximum capacity at continuous speeds above 75 mph (120 km/h).

Radial Ply Tires

WARNING!

Combining radial ply tires with other types of tires on your vehicle will cause your vehicle to handle poorly. The instability could cause an accident resulting in serious injury or death. Always use radial ply tires in sets of four (or six, in case of trucks with dual rear wheels). Never combine them with other types of tires.

Cuts and punctures in radial tires are repairable only in the tread area because of sidewall flexing. Consult your authorized tire dealer for radial tire repairs.

Limited Use Spare – If Equipped

The limited use spare tire is for temporary emergency use on your vehicle. This tire is identified by a limited use spare tire warning label located on the limited use spare tire and wheel assembly. This tire may look like the original equipped tire on the front or rear axle of your vehicle, but it is not. Installation of this limited use spare tire affects vehicle handling. Since it is not the same tire, replace (or repair) the original tire and reinstall on the vehicle at the first opportunity.

WARNING!

The limited use spare tires are for emergency use only. Installation of this limited use spare tire affects vehicle handling. With this tire, do not drive more than 60 mph (100 km/h). Keep inflated to the cold tire inflation pressure listed on either your tire placard or limited use spare tire and wheel assembly. Replace (or repair) the original tire at the first opportunity and reinstall it on your vehicle. Failure to do so could result in an accident causing serious injury or death.

Tire Spinning

When stuck in mud, sand, snow, or ice conditions, do not spin your vehicle's wheels faster than 30 mph (48 km/h) or for longer than 30 seconds continuously without stopping when you are stuck.

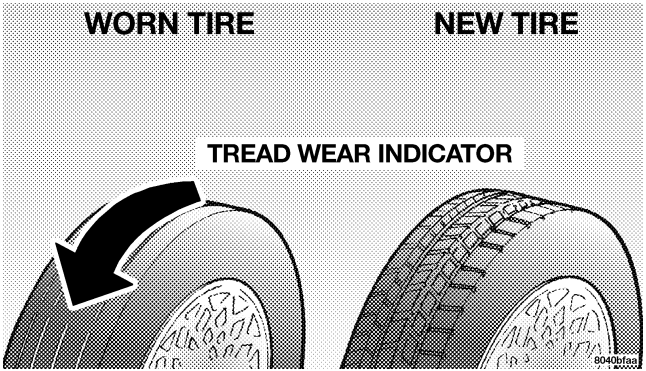
Refer to "Freeing A Stuck Vehicle" in Section 6 of this manual.

WARNING!

Fast spinning tires can be dangerous. Forces generated by excessive wheel speeds may cause tire damage or failure. A tire could explode and injure someone. Do not spin your vehicle's wheels faster than 30 mph (48 km/h) or for more than 30 seconds continuously when you are stuck, and don't let anyone near a spinning wheel, no matter what the speed.

Tread Wear Indicators

Tread wear indicators are in the original equipment tires to help you in determining when your tires should be replaced.



These indicators are molded into the bottom of the tread grooves. They will appear as bands when the tread depth becomes 1/16 in (2 mm). When the tread is worn to the tread wear indicators, the tire should be replaced.

Many states have laws requiring tire replacement at this point.

Life of Tire

The service life of a tire is dependent upon varying factors including, but not limited to:

- Driving style
- Tire pressure
- Distance driven

WARNING!

Tires and spare tire should be replaced after six years, regardless of the remaining tread. Failure to follow this warning can result in sudden tire failure. You could lose control and have an accident resulting in serious injury or death.

Keep dismounted tires in a cool, dry place with as little exposure to light as possible. Protect tires from contact with oil, grease, and gasoline.

Replacement Tires

The tires on your new vehicle provide a balance of many characteristics. They should be inspected regularly for wear and correct cold tire inflation pressure. The manufacturer strongly recommends that you use tires equivalent to the originals in size, quality and performance when replacement is needed (refer to the paragraph on "Tread Wear Indicators"). Refer to the Tire and Loading Information placard for the size designation of your tire. The service description and load identification will be found on the original equipment tire. Failure to use equivalent replacement tires may adversely affect the safety, handling, and ride of your vehicle. We recommend that you contact your original equipment or an authorized tire dealer with any questions you may have on tire specifications or capability.

WARNING!

- **Do not use a tire, wheel size or rating other than that specified for your vehicle. Some combinations of unapproved tires and wheels may change suspension dimensions and performance characteristics, resulting in changes to steering, handling, and braking of your vehicle. This can cause unpredictable handling and stress to steering and suspension components. You could lose control and have an accident resulting in serious injury or death. Use only the tire and wheel sizes with load ratings approved for your vehicle.**
- **Never use a tire with a smaller load index or capacity, other than what was originally equipped on your vehicle. Using a tire with a smaller load index could result in tire overloading and failure. You could lose control and have an accident resulting in serious injury or death.**
- **Failure to equip your vehicle with tires having adequate speed capability can result in sudden tire failure and loss of vehicle control resulting in serious injury or death.**

CAUTION!

Replacing original tires with tires of a different size may result in false speedometer and odometer readings.

Alignment And Balance

Poor suspension alignment may result in:

- Fast tire wear.
- Uneven tire wear, such as feathering and one-sided wear.
- Vehicle pull to right or left.

Tires may also cause the vehicle to pull to the left or right. Alignment will not correct this condition. See your authorized dealer for proper diagnosis.

Improper alignment will not cause vehicle vibration. Vibration may be a result of tire and wheel out-of-balance. Proper balancing will reduce vibration and avoid tire cupping and spotty wear.

SUPPLEMENTAL TIRE PRESSURE INFORMATION — IF EQUIPPED

A light load vehicle condition is defined as two passengers [150 lbs (68 kg) each] plus 200 lbs (91 kg) of cargo. Cold tire inflation pressures for a lightly loaded vehicle will be found on the face of the driver's door.

TIRE CHAINS

Use "Class U" chains on your vehicle, or other traction aids that meet SAE Type "U" specifications.

NOTE: Chains must be the proper size for the vehicle, as recommended by the chain manufacturer.

CAUTION!

To avoid damage to your vehicle, tires or chains, observe the following precautions:

- **Because of limited chain clearance between tires and other suspension components, it is important that only chains in good condition are used. Broken chains can cause serious vehicle damage. Stop the vehicle immediately if noise occurs that could suggest chain breakage. Remove the damaged parts of the chain before further use.**
- **Install chains as tightly as possible and then retighten after driving about 1/2 mi (0.8 km).**
- **Do not exceed 45 mph (72 km/h).**
- **Drive cautiously and avoid severe turns and large bumps, especially with a loaded vehicle.**
- **Do not install tire chains on front wheels of 4x2 vehicles.**
- **Do not drive for a prolonged period on dry pavement.**
- **Observe the tire chain manufacturer's instructions on method of installation, operating speed, and conditions for usage. Always use the lower suggested operating speed of the chain manufacturer if different than the speed recommended by the manufacturer.**

These cautions apply to all chain traction devices, including link and cable (radial) chains.

Tire chain use is permitted only on the rear tires of your 4X2 trucks.

NOTE: The use of class "U" snow chains is permitted on the rear wheels only of vehicles equipped with LT225/70R19.5 size tires.

CAUTION!

Do not use tire chains on the 4X4 front tires of vehicles equipped with LT225/70R19.5 tires. There may not be adequate clearance for the chains and you are risking structural or body damage to your vehicle.

SNOW TIRES

Snow tires should be of the same size and type construction as the front tires. Consult the manufacturer of the snow tire to determine any maximum vehicle speed requirement associated with the tire. These tires should always be operated at the vehicle maximum capacity inflation pressures under any load condition.

While studded tires improve performance on ice, skid and traction capability on wet or dry surfaces may be poorer than that of non-studded tires. Some states prohibit studded tires; therefore, local laws should be checked before using these tire types.

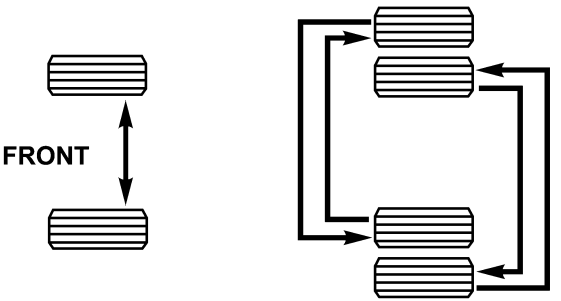
TIRE ROTATION RECOMMENDATIONS

Tires on the front and rear axles of vehicles operate at different loads and perform different steering, driving, and braking functions. For these reasons, they wear at unequal rates, and develop irregular wear patterns. These effects can be reduced by timely rotation of tires. The benefits of rotation are especially worthwhile with aggressive tread designs such as those on On/Off Road type tires. Rotation will increase tread life, help to maintain mud, snow, and wet traction levels, and contribute to a smooth, quiet ride.

Follow the recommended tire rotation frequency for your type of driving found in the "Maintenance Schedules" Section of this manual. More frequent rotation is permissible if desired. The reasons for any rapid or unusual wear should be corrected prior to rotation being performed.

NOTE: On Canadian vehicles only, if your vehicle is equipped with All-Season type tires on the front and On/Off Road type tires mounted on the rear, do not use a front to back rotation pattern. Instead, rotate your tires side to side at the recommended intervals.

Dual Rear Wheels



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The tires used on dual wheel assemblies should be matched for wear to prevent overloading one tire in a set. To check if tires are even, lay a straight edge across all four tires. The straight edge should touch all the tires.

ENGINE RUNAWAY

WARNING!

In case of engine runaway due to flammable fumes from gasoline spills or turbocharger oil leaks being sucked into the engine, do the following to help avoid personal injury and/or vehicle damage:

1. Shut off engine ignition switch.

2. Using a CO_2 or dry chemical type fire extinguisher, direct the spray from the fire extinguisher into the grille on the passenger side so that the spray enters the engine air intake.

The inlet for the engine air intake is located behind the passenger side headlamp and receives air through the grille.

FUEL REQUIREMENTS

Fuel Requirements (6.7L Diesel Engines)

Use good quality diesel fuel from a reputable supplier in your vehicle. Federal law requires that you must fuel this vehicle with Ultra Low Sulfur Highway Diesel fuel (15 ppm Sulfur maximum) and prohibits the use of Low Sulfur Highway Diesel fuel (500 ppm Sulfur maximum) to avoid damage to the emissions control system. For most year-round service, No. 2 diesel fuel meeting ASTM specification D-975 Grade S15 will provide good performance. If the vehicle is exposed to extreme cold (below 20°F or -7°C), or is required to operate at colder-than-normal conditions for prolonged periods, use climatized No. 2 diesel fuel or dilute the No. 2 diesel fuel with 50% No. 1 diesel fuel. This will provide better protection from fuel gelling or wax-plugging of the fuel filters.

WARNING!

Do not use alcohol or gasoline as a fuel blending agent. They can be unstable under certain conditions and hazardous or explosive when mixed with diesel fuel.

Diesel fuel is seldom completely free of water. To prevent fuel system trouble, drain the accumulated water from the **fuel/water separator using the fuel/water separator** drain provided. If you buy good quality fuel and follow the cold weather advice above, fuel conditioners should not be required in your vehicle. If available in your area, a high cetane "premium" diesel fuel may offer improved cold-starting and warm-up performance.

Fuel Specifications

The Cummins® Turbocharged, Charge Air Cooled, Diesel engine has been developed to take advantage of the high energy content and generally lower cost No. 2 Ultra Low Sulfur diesel fuel or No. 2 Ultra Low Sulfur climatized diesel fuels. Experience has shown that it also operates on No. 1 Ultra Low Sulfur diesel fuels or other fuels within specification.

NOTE: A maximum blend of 5% biodiesel meeting ASTM specification D-6751 may be used with your Cummins® Diesel equipped vehicle.

NOTE: In addition, commercially available fuel additives are not necessary for the proper operation of your Cummins® Diesel equipped vehicle.

NOTE: No. 1 Ultra Low Sulfur diesel fuel should only be used where extended arctic conditions (-10°F or -23°C) exist.

ADDING FUEL

Adding Fuel (Diesel Engines)

CAUTION!

To avoid fuel spillage and overfilling, do not "top off" the fuel tank after filling.

NOTE:

- When the fuel nozzle "clicks" or shuts off, the fuel tank is full.
- Tighten the gas cap until you hear a "clicking" sound. This is an indication that the gas cap is properly tightened.
- Make sure that the gas cap is tightened each time the vehicle is refueled.

WARNING!

A fire may result if fuel is pumped into a portable container that is on a truck bed. You could be burned. Always place fuel containers on the ground while filling.

Fuel Filler Cap (Gas Cap)

If the gas cap is lost or damaged, be sure the replacement cap is for use with this vehicle.

CAUTION!

Damage to the fuel system or emission control system could result from using an improper fuel tank filler tube cap (gas cap). A poorly fitting cap could let impurities into the fuel system.

WARNING!

- **Never have any smoking materials lit in or near the vehicle when the gas cap is removed or the tank filled.**
- **Never add fuel to the vehicle when the engine is running.**

Avoid Using Contaminated Fuel

Fuel that is contaminated by water or dirt can cause severe damage to the engine fuel system. Proper maintenance of the engine fuel filter and fuel tank is essential. (Refer to "Maintenance Procedures" in Section 7).

NOTE: Climatized Ultra Low Sulfur diesel fuel is a blend of Number 2 Ultra Low Sulfur and Number 1 Ultra Low Sulfur Diesel fuel which reduces the temperature at which wax crystals form in the fuel.

Bulk Fuel Storage

If you store quantities of fuel, good maintenance of the stored fuel is also essential. Fuel contaminated with water will promote the growth of "microbes." These microbes form "slime" that will clog fuel filters and lines. Drain condensation from the supply tank and change the line filter on a regular basis.

NOTE: When a diesel engine is allowed to run out of fuel, air is pulled into the fuel system.

You may try priming as described below. However, if the engine will not start, refer to the fuel priming procedure in the Service Manual or have the vehicle towed to an authorized dealer.

WARNING!

Do not open the high pressure fuel system with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.

Priming if the engine has run out of fuel

1. Add a substantial quantity of fuel to the tank: 5 to 10 gal (19 to 38L).

2. Crank the engine for one to two seconds. If the engine does not start, then release the key or starter button back to the RUN position (do not turn the key back to the OFF position). The electric fuel transfer pump will continue to run and purge air from the system for about 20 seconds. After 20 seconds, attempt to start the engine again.

3. Start the engine using the Normal Starting Procedure.

4. Repeat the procedure if the engine does not start.

CAUTION!

Do not engage the starter motor for more than 15 seconds at a time. Allow two minutes between the cranking intervals.

NOTE: The engine may run rough until the air is forced from all the fuel lines.

VEHICLE LOADING

Certification Label

As required by National Highway Traffic Safety Administration regulations, your vehicle has a certification label affixed to the driver's side door or pillar.

This label contains the month and year of manufacture, Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating (GAWR) front and rear, and Vehicle Identification Number (VIN). A Month-Day-Hour (MDH) number is included on this label and indicates the Month, Day and Hour of manufacture. The bar code that appears on the bottom of the label is your Vehicle Identification Number (VIN).

Gross Vehicle Weight Rating (GVWR)
The GVWR is the total permissible weight of your vehicle including driver, passengers, vehicle, options and cargo. The label also specifies maximum capacities of front and rear axle systems (GAWR). Total load must be limited so GVWR and front and rear GAWR are not exceeded.

Payload
The payload of a vehicle is defined as the allowable load weight a truck can carry, including the weight of the driver, all passengers, options and cargo.

Gross Axle Weight Rating (GAWR)
The GAWR is the maximum permissible load on the front and rear axles. The load must be distributed in the cargo area so that the GAWR of each axle is not exceeded.

Each axle GAWR is determined by the components in the system with the lowest load carrying capacity (axle, springs, tires or wheels). Heavier axles or suspension components sometimes specified by purchasers for increased durability does not necessarily increase the vehicle's GVWR.

Tire Size
The tire size on the Label represents the actual tire size on your vehicle. Replacement tires must be equal to the load capacity of this tire size.

Rim Size
This is the rim size that is appropriate for the tire size listed.

Inflation Pressure
This is the cold tire inflation pressure for your vehicle for all loading conditions up to full GAWR.

Curb Weight
The curb weight of a vehicle is defined as the total weight of the vehicle with all fluids, including vehicle fuel, at full capacity conditions, and with no occupants or cargo loaded into the vehicle. The front and rear curb weight values are determined by weighing your vehicle on a commercial scale before any occupants or cargo are added.

Loading
The actual total weight and the weight of the front and rear of your vehicle at the ground can best be determined by weighing it when it is loaded and ready for operation. The entire vehicle should first be weighed on a commercial scale to insure that the GVWR has not been exceeded. The weight on the front and rear of the vehicle should then be determined separately to be sure that the load is properly distributed over front and rear axle. Weighing the vehicle may show that the GAWR of either the front or rear axles has been exceeded but the total load is within the specified GVWR. If so, weight must be shifted from front to rear or rear to front as appropriate until the specified weight limitations are met. Store the heavier items down low and be sure that the weight is distributed equally. Stow all loose items securely before driving.

Improper weight distributions can have an adverse effect on the way your vehicle steers and handles and the way the brakes operate.

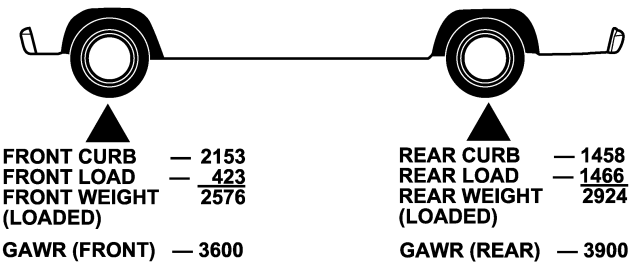
CAUTION!

Do not load your vehicle any heavier than the GVWR or the maximum front and rear GAWR. If you do, parts on your vehicle can break, or it can change the way your vehicle handles. This could cause you to lose control. Also overloading can shorten the life of your vehicle.

An EXAMPLE of a loaded vehicle is shown in the following chart. Note that neither GVWR nor GAWR capabilities are exceeded. Overloading can cause potential safety hazards and shorten service life.

NOTE: The weights shown in this chart are not necessarily the weights for your vehicle. Also, the amount of load added to both the front and rear axles can be computed after the vehicle has been weighed both in its "curb weight" condition, and in its "loaded and ready for operation" condition.

Gross Vehicle Weight Rating (GVWR) 6500 LBS (2948 kg).



TRAILER TOWING

In this section you will find safety tips and information on limits to the type of towing you can reasonably do with your vehicle. Before towing a trailer, carefully review this information to tow your load as efficiently and safely as possible.

To maintain warranty coverage, follow the requirements and recommendations in this manual concerning vehicles used for trailer towing.

Common Towing Definitions

The following trailer towing related definitions will assist you in understanding the following information:

Gross Vehicle Weight Rating (GVWR)

The GVWR is the total allowable weight of your vehicle. This includes driver, passengers, cargo and tongue weight. The total load must be limited so that you do not exceed the GVWR.

Gross Trailer Weight (GTW)

The gross trailer weight (GTW) is the weight of the trailer plus the weight of all cargo, consumables and equipment (permanent or temporary) loaded in or on the trailer in its "loaded and ready for operation" condition. The recommended way to measure GTW is to put your fully loaded trailer on a vehicle scale. The entire weight of the trailer must be supported by the scale.

Gross Combination Weight Rating (GCWR)

The gross combination weight rating (GCWR) is the total permissible weight of your vehicle and trailer when weighed in combination. (Note that GCWR ratings include a 150 lbs (68 kg) allowance for the presence of a driver).

Gross Axle Weight Rating (GAWR)
The GAWR is the maximum capacity of the front and rear axles. Distribute the load over the front and rear axles evenly. Make sure that you do not exceed either front or rear GAWR.

WARNING!

It is important that you do not exceed the maximum front or rear GAWR. A dangerous driving condition can result if either rating is exceeded. You could lose control of the vehicle and have an accident.

Tongue Weight (TW)
The downward force exerted on the hitch ball by the trailer is the tongue weight. In most cases it should not be less than 10% or more than 15% of the trailer load. You must consider this as part of the load on your vehicle.

Frontal Area
The maximum height and maximum width of the front of a trailer.

Trailer Sway Control
The trailer sway control is a telescoping link that can be installed between the hitch receiver and the trailer tongue that typically provides adjustable friction associated with the telescoping motion to dampen any unwanted trailer swaying motions while traveling.

Weight-Carrying Hitch

A weight-carrying hitch supports the trailer tongue weight, just as if it were luggage located at a hitch ball or some other connecting point of the truck. These kind of hitches are the most popular on the market today and they're commonly used to tow small- and medium-sized trailers.

Weight-Distributing Hitch

A weight-distributing system works by applying leverage through spring (load) bars. They are typically used for heavier loads, to distribute trailer tongue weight to the tow vehicle's front axle and the trailer axle(s). When used in accordance with the manufacturers' directions, it provides for a more level ride, offering more consistent steering and brake control, thereby enhancing towing safety. The addition of a friction/hydraulic sway control also dampens sway caused by traffic and crosswinds and contributes positively to tow vehicle and trailer stability. Trailer sway control and a weight distributing (load equalizing) hitch are recommended for heavier Tongue Weights (TW) and may be required depending on Vehicle and Trailer configuration/loading to comply with gross axle weight rating (GAWR) requirements.

WARNING!

An improperly adjusted weight-distributing hitch system may reduce handling, stability, braking performance, and could result in an accident.

Weight-distributing systems may not be compatible with surge brake couplers. Consult with your hitch and trailer manufacturer or an authorized recreational vehicle dealer for additional information.

EXAMPLE ONLY

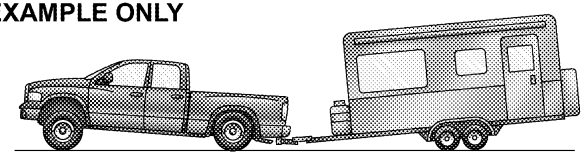


FIG. 1 WITHOUT WEIGHT DISTRIBUTION (INCORRECT)

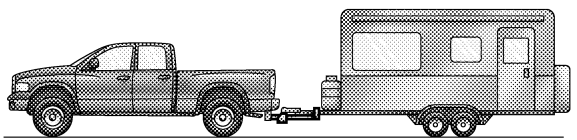


FIG 2. WITH WEIGHT DISTRIBUTION (CORRECT) 8181f965

Weight-Distributing Hitch System

EXAMPLE ONLY

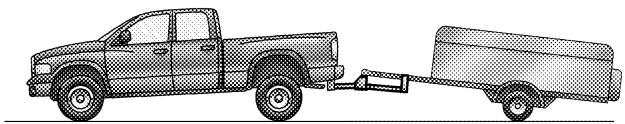


FIG. 3 IMPROPER ADJUSTMENT (INCORRECT)

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Improper Adjustment Of Weight-Distributing System

Fifth-Wheel Hitch

The fifth-wheel hitch is a special high platform with a coupling that mounts over the rear axle of the tow vehicle. It connects a vehicle and fifth-wheel trailer with a coupling king pin.

Gooseneck Hitch

The gooseneck hitch employs a pivoted coupling arm which attaches to a ball mounted over the rear axle. The coupling arm connects to the hitch.

Trailer Hitch Classification

The rear bumper is intended to tow trailers up to 2,000 lbs (907 kg) without added equipment or alterations to the standard equipment. Your vehicle may be factory equipped for safe towing of trailers weighing over 2,000 lbs (907 kg) with the optional Trailer Tow Prep Package. See your authorized dealer for package content.

The following chart provides the industry standard for the maximum trailer weight a given trailer hitch class can tow and should be used to assist you in selecting the correct trailer hitch for your intended towing condition. Refer to “Trailer Towing Weights (Maximum Trailer Weight Ratings)” for the website address that contains the necessary information for your specific drivetrain.

Trailer Hitch Classification	
Class	**Max. GTW (Gross Trailer Wt.)**
Class I - Light Duty	2,000 lbs (907 kg)
Class II - Medium Duty	3,500 lbs (1587 kg)
Class III - Heavy Duty	5,000 lbs (2268 kg)
Class IV - Extra Heavy Duty	10,000 lbs (4540 kg)
Fifth Wheel/Gooseneck	Greater than 10,000 lbs (4540 kg)

All trailer hitches should be professionally installed on your vehicle.

Trailer Towing Weights (Maximum Trailer Weight Ratings)

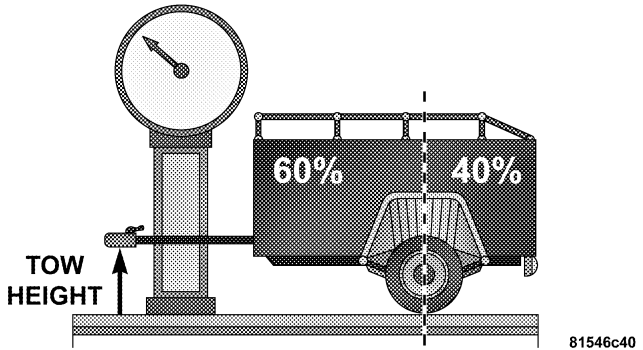
NOTE: For additional trailer towing information (maximum trailer weight ratings) refer to the Body Builder Guide at:

- **http://www.SterlingTrucks.com**.

Trailer and Tongue Weight

Always load a trailer with 60% to 65% of the weight in the front of the trailer. This places 10% to 15% of the Gross Trailer Weight (GTW) on the tow hitch of your vehicle. Loads balanced over the wheels or heavier in the rear can cause the trailer to sway **severely** side to side which will cause loss of control of vehicle and trailer. Failure to load trailers heavier in front is the cause of many trailer accidents.

Never exceed the maximum tongue weight stamped on your bumper or trailer hitch.



Consider the following items when computing the weight on the rear axle of the vehicle:

- The tongue weight of the trailer.
- The weight of any other type of cargo or equipment put in or on your vehicle.
- The weight of the driver and all passengers.

NOTE: Remember that everything put into or on the trailer adds to the load on your vehicle. Also, additional factory-installed options, or authorized dealer-installed options must be considered as part of the total load on your vehicle. Refer to "Tire and Loading Information placard" under "Tire Safety Information" in Section 5.

Towing Requirements

To promote proper break-in of your new vehicle drivetrain components, the following guidelines are recommended:

5

CAUTION!

- **Avoid towing a trailer for the first 500 mi (805 km) of vehicle operation. Doing so may damage your vehicle.**
- **During the first 500 mi (805 km) of trailer towing, limit your speed to 50 mph (80 km/h).**

Perform the maintenance listed in Section 8 of this manual. When towing a trailer, never exceed the GAWR, or GCWR, ratings.

WARNING!

Improper towing can lead to an injury accident. Follow these guidelines to make your trailer towing as safe as possible:

Make certain that the load is secured in the trailer and will not shift during travel. When trailering cargo that is not fully secured, dynamic load shifts can occur that may be difficult for the driver to control. You could lose control of your vehicle and have an accident.

- When hauling cargo or towing a trailer, do not overload your vehicle or trailer. Overloading can cause a loss of control, poor performance or damage to brakes, axle, engine, transmission, steering, suspension, chassis structure or tires.
- Safety chains must always be used between your vehicle and trailer. Always connect the chains to the frame or hook retainers of the vehicle hitch. Cross the chains under the trailer tongue and allow enough slack for turning corners.
- Vehicles with trailers should not be parked on a grade. When parking, apply the parking brake on the tow vehicle. Put the tow vehicle automatic transmission in PARK. With a manual transmission, shift the transmission into REVERSE. And with 4-wheel drive vehicles, make sure the transfer case is not in NEUTRAL. Always, block or "chock" the trailer wheels.
- GCWR must not be exceeded.

- **Total weight must be distributed between the tow vehicle and the trailer such that the following four ratings are not exceeded:**

  1. GVWR

  2. GTW

  3. GAWR

  4. Tongue weight rating for the trailer hitch utilized (This requirement may limit the ability to always achieve the 10% to 15% range of tongue weight as a percentage of total trailer weight.)

Towing Requirements — Tires

– Do not attempt to tow a trailer while using a compact spare tire.

– Proper tire inflation pressures are essential to the safe and satisfactory operation of your vehicle. Refer to "Tire Pressures" under "Tires–General Information" in this section 5.

– Also, check the trailer tires for proper tire inflation pressures before trailer usage.

– Check for signs of tire wear or visible tire damage before towing a trailer. Refer to "Tread Wear Indicator" under "Tires–General Information" in this section 5.

– When replacing tires, refer to "Replacement Tires" under "Tires–General Information" in Section 5. Replacing tires with a higher load carrying capacity will not increase the vehicle's GVWR and GAWR limits.

Towing Requirements — Trailer Brakes

– Do **not** interconnect the hydraulic brake system or vacuum system of your vehicle with that of the trailer. This could cause inadequate braking and possible personal injury.

– An electronically actuated trailer brake controller is required when towing a trailer with electronically actuated brakes. When towing a trailer equipped with a hydraulic surge actuated brake system, an electronic brake controller is not required.

– Trailer brakes are recommended for trailers over 1,000 lbs (454 kg) and required for trailers in excess of 2,000 lbs (907 kg).

CAUTION!

If the trailer weighs more than 1,000 lbs (454 kg) loaded, it should have its own brakes and they should be of adequate capacity. Failure to do this could lead to accelerated brake lining wear, higher brake pedal effort, and longer stopping distances.

WARNING!

Do not connect trailer brakes to your vehicle's hydraulic brake lines. It can overload your brake system and cause it to fail. You might not have brakes when you need them and could have an accident.

Towing any trailer will increase your stopping distance. When towing you should allow for additional space between your vehicle and the vehicle in front of you. Failure to do so could result in an accident.

Towing Requirements — Trailer Lights & Wiring
Whenever you pull a trailer, regardless of the trailer size, stop lights and turn signals on the trailer are required for motoring safety.

Twelve trailer tow circuits are provided at the rear of the chassis. These circuits are unterminated and sealed. Seven of the 12 circuits are the standard 7-pin trailer wiring circuits. Three of the 12 circuits are upfitter circuits used for aftermarket applications. Two of the 12 circuits are additional trailer circuits. For additional information about trailer tow circuits or other exterior lighting capabilities of your vehicle, refer to the Body Builder's Guide by accessing "www.SterlingTrucks.com" and choosing the appropriate links.

NOTE: Do not cut or splice wiring into the vehicles wiring harness.

WARNING!

Any work done to the vehicle's electrical system or wiring should be performed by a qualified automotive technician. If done improperly it may cause damage to the electrical system wiring and could result in serious or fatal injury.

The following chart identifies the maximum electrical loads that the trailer tow output circuits are capable of supporting.

Trailer Tow Additional Lamp Loads		
Output Functions	Maximum Current	Additional Bulbs Allowed. Example Only. Other bulb combinations can be used as long as maximum current is not exceeded.
Stop/Turn Left	16A	2 #3157 bulbs for stop/turn
Stop/Turn Right	16A	2 #3157 bulbs for stop/turn
Trailer Park Lamps	14A	2 #1157 bulbs (two filament park/stop/turn) plus up to 24 #168 or #194 peanut bulbs.

Towing Tips

Before setting out on a trip, practice turning, stopping and backing the trailer in an area away from heavy traffic.

If using a manual transmission vehicle for trailer towing, all starts must be in FIRST gear to avoid excessive clutch slippage.

Towing Tips — Automatic Transmission

The "D" range can be selected when towing. However, if frequent shifting occurs while in this range, the "TOW HAUL" or "OD/OFF" range should be selected.

NOTE: Using the "TOW HAUL" or "OD/OFF" range while operating the vehicle under heavy operating conditions will improve performance and extend transmission life by reducing excessive shifting and heat build up. This action will also provide better engine braking.

The automatic transmission fluid and filter should be changed if you REGULARLY tow a trailer for more than 45 minutes of continuous operation. Refer "Maintenance Schedule" in Section 8 of this manual for transmission fluid change intervals.

NOTE: Check the automatic transmission fluid level before towing.

Towing Tips — Tow/Haul (If Equipped)
To reduce potential for automatic transmission overheating, turn the "TOW HAUL OD/OFF" feature ON when driving in hilly areas or shift the transmission to Drive position 2 on more severe grades.

Towing Tips — Electronic Speed Control (If Equipped)

– Don't use in hilly terrain or with heavy loads.
– When using the speed control, if you experience speed drops greater than 10 mph (16 km/h), disengage until you can get back to cruising speed.
– Use speed control in flat terrain and with light loads to maximize fuel efficiency.

Towing Tips — Cooling System
To reduce potential for engine and transmission overheating, take the following actions:

– City Driving
When stopped for short periods of time, put transmission in NEUTRAL and increase engine idle speed.

– Highway Driving
Reduce speed.

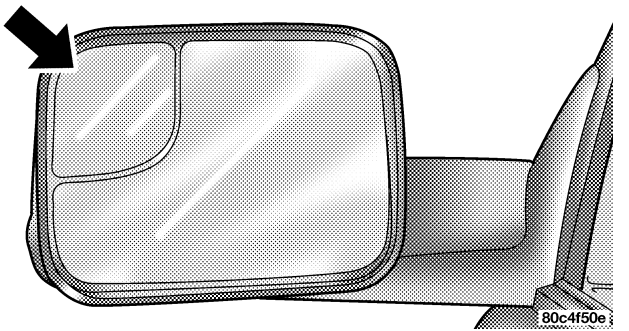
– Air Conditioning
Turn off temporarily.

– Refer to “Cooling System” under “Maintenance Procedures” in Section 7.

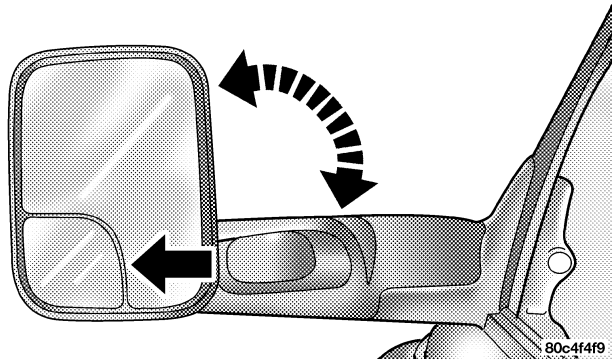
Trailer Towing Mirrors — If Equipped

These mirrors are designed with an adjustable mirror head to provide a greater vision range when towing extra-wide loads. To change position inboard or outboard, the mirror head should be rotated (flipped out or in). A small blindspot mirror is integrated onto the main mirror surface.

NOTE: Fold the trailer towing mirrors rearward prior to entering an automated car wash.



Blindspot Mirror



Trailer Towing Position

SNOWPLOW

Snowplow Prep Packages are available as a factory installed option. These packages include components necessary to equip your vehicle with a snowplow.

NOTE: Before installation of a snowplow it is highly recommended that the owner/installer obtain and follow the recommendations contained within the current Sterling Bullet Body Builders Guide. See your authorized dealer, installer or snowplow manufacturer for this information. There are unique electrical systems that must be connected to properly assure operator safety and prevent overloading vehicle systems.

WARNING!

Attaching a snowplow to this vehicle could adversely affect performance of the airbag system in an accident. Do not expect that the airbag will perform as described earlier in this manual

CAUTION!

The "Lamp Out" indicator could illuminate if exterior lamps are not properly installed.

Before plowing

- Check the hydraulic system for leaks and proper fluid level.
- Check the mounting bolts and nuts for proper tightness.
- Check the runners and cutting edge for excessive wear. The cutting edge should be 1/4 to 1/2 in (0.6 cm to 1.2 cm) above ground in snow plowing position.
- Check that snowplow lighting is connected and functioning properly.

Snowplow Prep Package Model Availability

For Information about snowplow applications visit www.SterlingTrucks.com or refer to the current Sterling Bullet Body Builders Guide.

1. The maximum number of occupants in the truck should not exceed two.

2. The total GVWR or the Front GAWR or the Rear GAWR should never be exceeded.

3. Cargo capacity will be reduced by the addition of options or passengers, etc.

The loaded vehicle weight, including the snowplow system, all aftermarket accessories, driver, passengers, options, and cargo, must not exceed either the Gross Vehicle Weight (GVWR) or Gross Axle Weight (GAWR) ratings. These weights are specified on the Safety Compliance Certification Label on the driver's side door opening.

NOTE: Detach the snowplow when transporting passengers.

Vehicle front end wheel alignment was set to specifications at the factory without consideration for the weight of the plow. Front end toe-in should be checked and reset

if necessary at the beginning and end of the snowplow season. This will help prevent uneven tire wear.

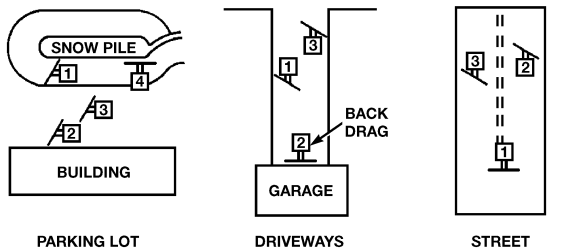
The blade should be lowered whenever the vehicle is parked.

Maintain and operate your vehicle and snowplow equipment following the recommendations provided by the specific snowplow manufacturer.

Over the Road Operation With Snowplow Attached

The blade restricts air flow to the radiator and causes the engine to operate at higher than normal temperatures. Therefore, when transporting the plow, angle the blade completely and position it as low as road or surface conditions permit. Do not exceed 40 mph (64 km/h). The operator should always maintain a safe stopping distance and allow adequate passing clearance.

Methods For Removing Snow



Operating Tips

Under ideal snow plowing conditions, 20 mph (32 km/h) should be maximum operating speed. The operator should be familiar with the area and surface to be cleaned. Reduce speed and use extreme caution when plowing unfamiliar areas or under poor visibility.

NOTE: During snowplow usage on vehicles equipped with an overhead console module, the outside temperature display will show higher temperatures than the outside ambient temperature. The higher displayed temperature is due to blocked or reduced airflow to the underhood ambient temperature sensor by the snowplow. This is common and outside temperature display operation will return to normal when the snowplow is removed.

General Maintenance

Snowplows should be maintained in accordance with the plow manufacturer's instructions.

Keep all snowplow electrical connections and battery terminals clean and free of corrosion.

When plowing snow, to avoid transmission and drivetrain damage, the following precautions should be observed.

- Operate with transfer case in 4L when plowing small or congested areas where speeds are not likely to exceed 15 mph (24 km/h). At higher speeds operate in 4H.
- Vehicles with automatic transmissions should use 4L range when plowing deep or heavy snow for extended periods of time to avoid transmission overheating.
- Do not shift the transmission unless the engine has returned to idle and wheels have stopped. Make a practice of stepping on the brake pedal before shifting the transmission.

RECREATIONAL TOWING (BEHIND MOTORHOME, ETC.)

CAUTION!

Front or rear wheel lifts should not be used. Internal damage to the transmission or transfer case will occur if a front or rear wheel lift is used when recreational towing.

Recreational Towing – 2-Wheel Drive Models

Recreational towing of 2-Wheel Drive models is not allowed. Towing with the rear wheels on the ground can result in severe transmission damage.

Recreational Towing – 4-Wheel Drive Models

CAUTION!

Failure to follow these requirements can cause severe damage to the transmission and/or transfer case.

NOTE: Both the Manual Shift and Electronic Shift transfer cases must be shifted into NEUTRAL for recreational towing. Automatic transmissions must be shifted into PARK position for recreational towing. Manual transmissions must be left in gear (not in NEUTRAL) for recreational towing. Refer to the following for the proper transfer case NEUTRAL shifting procedure for your vehicle.

Recreational Towing Procedure — Manual Shift Transfer Case — If Equipped

Use the following procedure to prepare your vehicle for recreational towing:

CAUTION!

It is necessary to follow these steps to be certain that the transfer case is fully in NEUTRAL before recreational towing to prevent damage to internal parts.

1. Bring the vehicle to a complete stop.
2. Shut OFF the engine.
3. Depress the brake pedal.
4. Shift automatic transmission to NEUTRAL, or depress the clutch on manual transmissions.
5. Shift transfer case lever into NEUTRAL.
6. Start the engine.
7. Shift automatic transmission into REVERSE.
8. Release brake pedal for five seconds and ensure that there is no vehicle movement.
9. Repeat steps 7 and 8 with the transmission in DRIVE.
10. Shut OFF the engine and place the ignition key in the unlocked OFF position.
11. Shift automatic transmission into PARK or 1st gear on manual transmissions.
12. Apply the parking brake.
13. Attach vehicle to tow vehicle with tow bar.
14. Release the parking brake.

CAUTION!

Damage to the automatic transmission may occur if the transmission is shifted into PARK with the transfer case in NEUTRAL and the engine running. With the transfer case in NEUTRAL ensure that the engine is OFF prior to shifting the transmission into PARK.

Returning to Normal Operation — Manual Shift Transfer Case

Use the following procedure to prepare your vehicle for normal usage:

1. Bring the vehicle to a complete stop.
2. Apply the parking brake.
3. Shut OFF the engine.
4. Depress the brake pedal.
5. Shift automatic transmission to NEUTRAL, or depress the clutch on manual transmissions.
6. Shift transfer case lever to desired position.
7. Shift automatic transmission into PARK.

WARNING!

You or others could be injured if you leave the vehicle unattended with the transfer case in the NEUTRAL position without first fully engaging the parking brake. The transfer case NEUTRAL position disengages both the front and rear driveshafts from the powertrain and will allow the vehicle to move, regardless of the transmission position. The parking brake should always be applied when the driver is not in the vehicle.

CAUTION!

- **Do not use a bumper-mounted clamp-on tow bar on your vehicle. The bumper face bar will be damaged.**
- **Do not disconnect the rear driveshaft because fluid will leak from the transfer case and damage the internal parts.**

Recreational Towing Procedure — Electronic Shift Transfer Case — If Equipped

Use the following procedure to prepare your vehicle for recreational towing:

CAUTION!

It is necessary to follow these steps to be certain that the transfer case is fully in NEUTRAL before recreational towing, to prevent damage to internal parts.

1. Bring vehicle to a complete stop.
2. Shut OFF the engine.
3. Turn the ignition key to the ON position, but do not start the engine.
4. Depress the brake pedal.
5. Shift automatic transmission to NEUTRAL or depress clutch on manual transmission.
6. Using the point of a ballpoint pen or similar object, depress the recessed transfer case NEUTRAL button for four seconds.

7. After shift is completed and the NEUTRAL light comes on, release the NEUTRAL button.

8. Start engine.

9. Shift automatic transmission into REVERSE.

10. Release brake pedal for five seconds and ensure that there is no vehicle movement.

11. Repeat steps 9 and 10 with the transmission in DRIVE.

12. Shut engine OFF and place ignition key in the unlocked OFF position.

13. Shift automatic transmission into PARK or 1st gear on manual transmissions.

14. Apply parking brake.

15. Attach vehicle to tow vehicle with tow bar.

16. Release parking brake.

NOTE: Steps 1 through 5 are requirements that must be met prior to depressing the NEUTRAL selection button, and must continue to be met until the four seconds elapses and the shift has been completed. If any of these requirements (with the exception of 3 - Key ON) are not met prior to depressing the NEUTRAL button or are no longer met during the four second timer, then the NEUTRAL indicator light will flash continuously until all requirements are met or until the NEUTRAL button is released.

NOTE: The ignition key must be ON for a shift to take place and for the position indicator lights to be operable. If the key in not ON, the shift will not take place and no position indicator lights will be on or flashing.

NOTE: Flashing NEUTRAL position indicator light indicates that shift requirements have not been met.

CAUTION!

Damage to the transmission may occur if the transmission is shifted into PARK with the transfer case in NEUTRAL and the engine running. With the transfer case in NEUTRAL ensure, that the engine is OFF prior to shifting the transmission into PARK.

Returning to Normal Operation — Electronic Shift Transfer Case

Use the following procedure to prepare your vehicle for normal usage:

1. Bring vehicle to a complete stop.
2. Shut OFF the engine.
3. Turn the ignition key to the ON position, but do not start the engine.
4. Depress the brake pedal.
5. Shift automatic transmission to NEUTRAL or depress clutch on manual transmission.
6. Using the point of a ballpoint pen or similar object, depress the recessed transfer case Neutral (N) button for one second.
7. After the Neutral indicator light turns off, release the Neutral (N) button.
8. After the Neutral (N) button has been released, the transfer case will shift to the position identified by the selector switch.
9. Shift automatic transmission into PARK.

NOTE: The transfer case cannot be shifted into NEUTRAL from the 4AUTO (if equipped) position.

NOTE: Steps 1 through 5 are requirements that must be met prior to depressing the transfer case Neutral (N) button, and must continue to be met until one second elapses and the shift has been completed. If any of these requirements (with the exception of step 3 - key ON) are not met prior to depressing the Neutral (N) button, or are no longer met during the one second time, then all of the mode position indicator lights will flash continuously until all requirements are met, or until the Neutral (N) button is released.

NOTE: The ignition key must be ON for a transfer case shift to take place and for the position indicator lights to be operable. If the key is not ON, the shift will not take place and no position indicator lights will be on or flashing.

NOTE: Flashing Neutral position indicator light indicates that shift requirements have not been met.

WARNING!

You or others could be injured if you leave the vehicle unattended with the transfer case in the NEUTRAL position without first fully engaging the parking brake. The transfer case NEUTRAL position disengages both the front and rear driveshafts from the powertrain and will allow the vehicle to move despite the transmission position. The parking brake should always be applied when the driver is not in the vehicle.

CAUTION!

- **Do not use a bumper-mounted clamp-on tow bar on your vehicle. The bumper face bar will be damaged.**
- **Do not disconnect the rear driveshaft because fluid will leak from the transfer case and fluid loss will damage internal parts.**

WHAT TO DO IN EMERGENCIES

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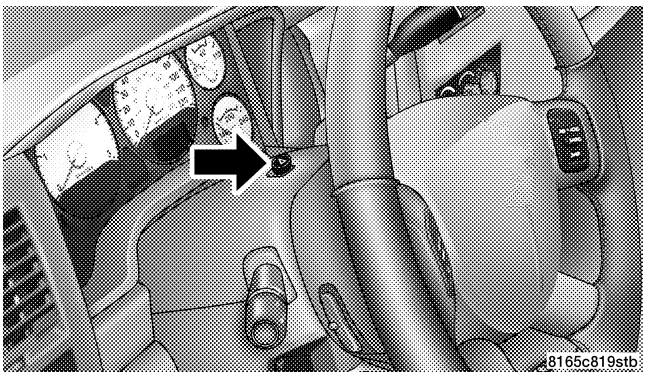
HAZARD WARNING FLASHER

The Hazard Warning switch is mounted on the top of the steering column as shown in the illustration.



Sterling Hazard Light Warning Switch

To engage the Hazard Warning lights, depress the button on the top of the steering column. When the Hazard Warning switch is activated, all directional turn signals will flash off and on to warn oncoming traffic of an emergency. Push the button a second time to turn off the flashers.

This is an emergency warning system and should not be used when the vehicle is in motion. Use it when your vehicle is disabled and is creating a safety hazard for other motorists.

When you must leave the vehicle to seek assistance, the Hazard Warning lights will continue to operate even though the ignition switch is OFF.

NOTE: With extended use, the Hazard Warning lights may discharge your battery.

JACKING AND TIRE CHANGING

WARNING!

- **Being under a jacked-up vehicle is dangerous. The vehicle could slip off the jack and fall on you. You could be crushed. Never put any part of your body under a vehicle that is on a jack. Never start or run the engine while the vehicle is on a jack. If you need to get under a raised vehicle, take it to a service center where it can be raised on a lift.**
- **The vehicle should be jacked on a firm level surface only. Avoid ice or slippery areas.**

JACKING INSTRUCTIONS

Tire Changing Procedure

WARNING!

Getting under a jacked-up vehicle is dangerous. The vehicle could slip off the jack and fall on you. You could be crushed. Never get any part of your body under a vehicle that is on a jack. Never start or run the engine while the vehicle is on a jack. If you need to get under a raised vehicle, take it to a service center where it can be raised on a lift.

It is not recommended that a jack be used for service purposes or to lift more than one wheel at a time.

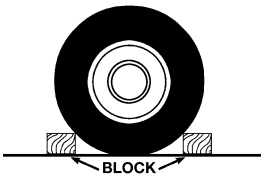
NOTE: Jacking and tire changing on 4500/5500 models should be performed by an authorized dealer, or knowledgeable service personnel with the appropriate heavy duty equipment, like a tire service company.

Preparations
Park the vehicle on a firm level surface, avoiding ice or slippery areas. Set the parking brake and place the gear selector in PARK (automatic transmission) or REVERSE (manual transmission). On 4-wheel drive vehicles, shift the transfer case to the "4L" position.

WARNING!

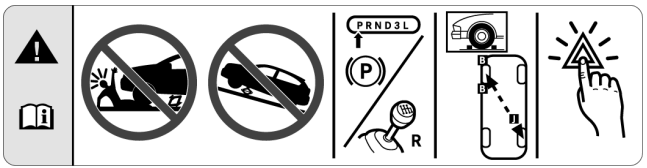
Do not attempt to change a tire on the side of the vehicle close to moving traffic. Pull far enough off the road to avoid the danger of being hit when operating the jack or changing the wheel.

- Turn on the Hazard Warning flasher.



- Block both the front and rear of the wheel diagonally opposite the jacking position. For example, if the right front wheel is being changed, block the left rear wheel.
- Passengers should not remain in the vehicle when the vehicle is being jacked.

Instructions



Jack Warning Label

WARNING!

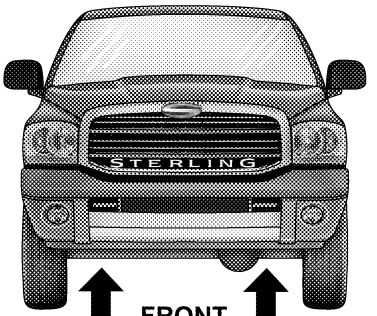
Carefully follow these tire changing warnings to help prevent personal injury or damage to your vehicle:

- Always park on a firm, level surface as far from the edge of the roadway as possible before raising the vehicle.
- Block the wheel diagonally opposite the wheel to be raised.
- Set the parking brake firmly and set an automatic transmission in park; a manual transmission in reverse.
- Never start or run the engine with the vehicle on a jack.
- Do not let anyone sit in the vehicle when it is on a jack.
- Do not get under the vehicle when it is on a jack.
- Only use the jack in the positions indicated and for lifting this vehicle during a tire change.
- If working on or near a roadway, be extremely careful of motor traffic.
- To assure that spare tires, flat or inflated are securely stowed, spares must be stowed with the valve stem facing the ground.
- Turn on the Hazard warning flasher.

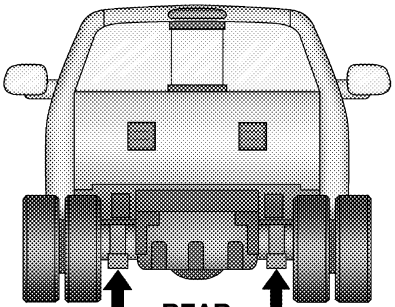
1. If equipped, remove the spare wheel.

2. Loosen, but do not remove, the wheel nuts by turning them counterclockwise one turn while the wheel is still on the ground.

3. When changing the front wheel, place the jack under the axle as close to the tire as possible with the drive tubes extending to the front.



When changing a rear wheel, securely place the jack under the sway bar bracket (unless both tires are flat on one side, then place jack under shock bracket) facing forward in vehicle.



Before raising the wheel off the ground, make sure that the jack will not damage surrounding truck parts and adjust the jack position as required.

4. Raise the vehicle until the wheel just clears the surface.

WARNING!

Raising the vehicle higher than necessary can make the vehicle unstable and cause an accident. It could slip off the jack and hurt someone near it. Raise the vehicle only enough to remove the tire.

5. Remove the wheel nuts and pull the wheel off.

NOTE: Do not oil wheel studs.

6. Install the spare wheel and the lug nuts. Lightly tighten the nuts. To avoid risk of forcing the vehicle off the jack, do not fully tighten the nuts until the vehicle has been lowered.

7. Lower the vehicle.

8. Using the wheel wrench, finish tightening the nuts using a crisscross pattern. Correct nut tightness is 145 ft. lbs. (197 N·m). If in doubt about the correct tightness, have them checked with a torque wrench by your authorized dealer or at a service station.

WARNING!

A loose tire or jack thrown forward in a collision or hard stop could injure someone in the vehicle. Always stow the jack parts and the extra tire and wheel in the places provided.

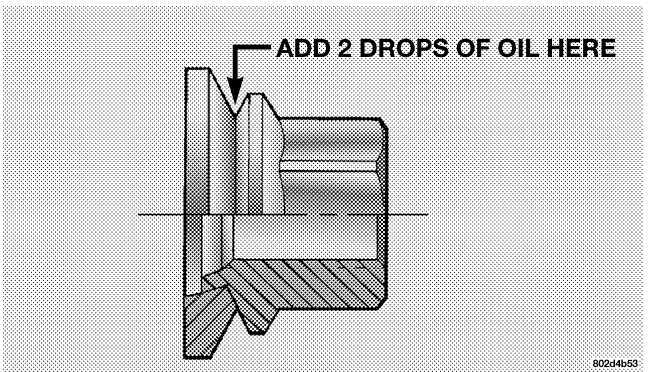
9. Lower the jack to its fully closed position. Stow the replaced tire.

10. Adjust the tire pressure when possible.

Dual Rear Wheels

Dual wheels are flat mounted, center piloted. The lug nuts are a two-piece assembly. When the tires are being rotated or replaced, clean these lug nuts and add two drops of oil at the interface between the hex and the washer.

NOTE: Do not oil wheel studs.

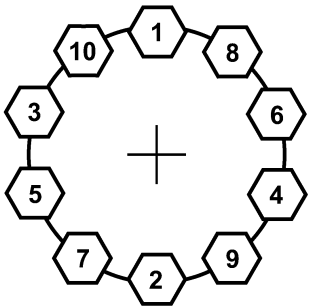


Slots in the wheels will assist in properly orienting the inner and outer wheels. Align these slots when assembling the wheels for best access to the tire valve on the inner wheel. The tires of both dual wheels must be completely off the ground when tightening to insure wheel centering and maximum wheel clamping.

Dual wheel models require a special heavy-duty lug nut tightening adapter (included with the vehicle) to correctly tighten the lug nuts. Also, when it is necessary to remove and install dual rear wheels, use a proper vehicle lifting device.

NOTE: When installing a spare tire (if equipped) as part of a dual rear wheel end combination, the tire diameter of the two individual tires must be compared. If there is a significant difference, the larger tire should be installed in a front location. Correct direction of rotation for dual tire installations must also be observed.

These dual rear wheels should be tightened as follows:



1. Tighten the wheel nuts in the numbered sequence to a snug fit.

2. Retighten the wheel nuts in the same sequence to the torques listed in the table. Go through the sequence a second time to verify that specific torque has been achieved. Retighten to specifications at 100 mi (160 km) and after 500 mi (800 km).

It is recommended that wheel stud nuts be kept torqued to specifications at all times. Torque wheel stud nuts to specifications at each lubrication interval.

Wheel Nut Torque

All wheel nuts should be tightened occasionally to eliminate the possibility of wheel studs being sheared or the bolt holes in the wheels becoming elongated. This is especially important during the first few hundred miles/kilometers of operation to allow the wheel nuts to become properly set. All nuts should first be firmly seated against the wheel. The nuts should then be tightened to recommended torque. Tighten the nuts to final torque in increments. Progress around the bolt circle, tightening the nut opposite to the nut just previously tightened until final torque is achieved. Recommended torques are shown in the following chart.

Disc Wheels	Type Nut	Stud Size	Torque Ft. Lbs.	Torque Newton Meters
	Flanged	9/16-18	130-160	190-220

To Stow The Flat Or Spare (If Equipped)

Refer to Body Builders Guide for information on stowing your spare tire (if equipped).

HOISTING

A conventional floor jack may be used at the jacking locations. Refer to the graphics that show jacking locations. However, a floor jack or frame hoist must never be used on any other parts or the underbody.

CAUTION!

Never use a floor jack directly under the differential housing of a loaded truck or damage to your vehicle may result.

JUMP-STARTING

WARNING!

To prevent personal injury or damage to clothing, do not allow battery fluid to contact eyes, skin or fabrics. Do not lean over a battery when connecting jumper cables or allow cable clamps to touch each other. Keep open flames or sparks away from battery vent holes. Always wear eye protection when working with batteries.

Do not use a booster battery or any other booster source that has a greater than 12-volt system, i.e., do not use a 24-volt power source.

NOTE: Replacement batteries should both be of equal size to prevent damage to the vehicle's charging system.

Your vehicle is equipped with two 12–volt batteries. If it becomes necessary to use a booster battery with jumper cables to start a vehicle's engine because its batteries are discharged, the following procedure should be used:

Set the parking brake and place an automatic transmission in PARK (or NEUTRAL for a manual transmission). Turn off lights, heater and other electrical loads. Observe charge indicator (if equipped) in both batteries. If indicator (if equipped) is light or yellow on either battery, replace that battery.

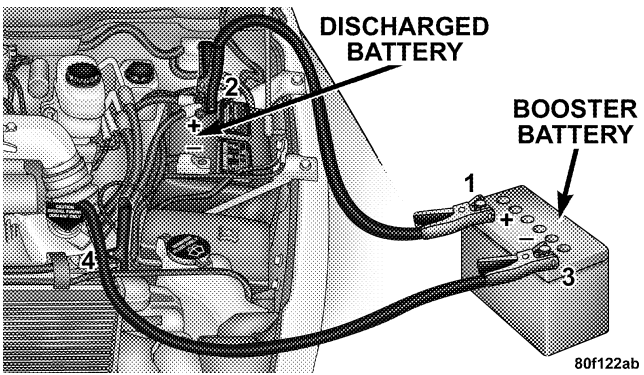
CAUTION!

Use the Jump-Start Procedure only when the charge indicator (if equipped) in both batteries is dark in the center. Do not attempt jump-starting when either battery charge indicator (if equipped) is bright or yellow. If charge indicator (if equipped) has a green dot in the center, failure to start is not due to a discharged battery and cranking system should be checked.

1. Attach one jumper cable to the positive terminal of booster battery and the other end of the same cable to the positive terminal of the discharged battery.

WARNING!

Do not permit vehicles to touch each other as this could establish a ground connection and personal injury could result.



2. Connect one end of the other jumper cable to negative (-) post of booster battery. Connect the other end of the jumper cable to a good ground on the engine block of the vehicle with the discharged battery. Make sure a good connection is made, free of dirt and grease.

WARNING!

- **Do not connect the cable to the negative post of the discharge battery. The resulting electrical spark could cause the battery to explode.**
- **During cold weather when temperatures are below freezing point, electrolyte in a discharged battery may freeze. Do not attempt jump-starting because the battery could rupture or explode. The battery temperature must be brought up above freezing point before attempting to jump-start.**

3. Take care that the clamps from one cable do not inadvertently touch clamps from the other cable. Do not lean over the battery when making connection. The negative connection must provide good electrical conductivity and current carrying capacity.

4. After the engine is started or if the engine fails to start, cables must be disconnected in the following order:

a. Disconnect the negative cable at the engine ground.

b. Disconnect the negative cable at the negative post on booster battery.

c. Disconnect the cable from the positive post of both batteries.

WARNING!

Any procedure other than above could result in:

1. Personal injury caused by electrolyte squirting out the battery vent;

2. Personal injury or property damage due to battery explosion;

3. Damage to charging system of booster vehicle or of immobilized vehicle.

With Portable Starting Unit

There are many types of these units available. Follow the manufacturer's instructions for necessary precautions and operation.

CAUTION!

It is very important that the starting unit operating voltage does not exceed 12-Volts DC or damage to battery, starter motor, alternator, or electrical system may occur.

FREEING A STUCK VEHICLE

If the vehicle becomes stuck in snow, sand, or mud, it can often be moved by a rocking motion. Move the gear selector rhythmically between DRIVE and REVERSE (automatic transmissions) or between 1st and REVERSE (manual transmissions), while applying slight pressure to the accelerator.

In general, the least amount of accelerator pedal pressure to maintain the rocking motion without spinning the wheels or racing the engine, is most effective. Racing the engine or spinning the wheels, due to the frustration of not freeing the vehicle, may lead to transmission overheating and failure. Allow the engine to idle with the transmission selector in NEUTRAL for at least one minute after every five rocking-motion cycles. This will minimize overheating and reduce the risk of transmission failure during prolonged efforts to free a stuck vehicle.

EMERGENCY TOW HOOKS — IF EQUIPPED

Your vehicle may be equipped with emergency tow hooks.

NOTE: For off-road recovery, it is recommended to use both of the front tow hooks to minimize the risk of damage to the vehicle.

WARNING!

Chains are not recommended for freeing a stuck vehicle. Chains may break, causing serious injury or death.

WARNING!

Stand clear of vehicles when pulling with tow hooks. Tow straps and chains may break, causing serious injury.

CAUTION!

Tow hooks are for emergency use only, to rescue a vehicle stranded off-road. Do not use tow hooks for tow truck hookup or highway towing. You could damage your vehicle.

TOWING A DISABLED VEHICLE

Proper towing or lifting equipment is required to prevent damage to your vehicle. Use only tow bars and other equipment designed for the purpose, following equipment manufacturer's instructions. Use of safety chains is mandatory. Attach a tow bar or other towing device to the main structural members of the vehicle—not to bumpers or associated brackets. State and local laws applying to vehicles under tow must be observed.

4-Wheel Drive Vehicles

CAUTION!

To avoid damage to the transfer case while towing, always use one of the following methods.

NOTE: The transfer case must be in the neutral position, and the transmission must be in PARK (automatic transmission), or in gear (manual transmission) to tow a 4WD vehicle with one end of the vehicle raised.

The manufacturer recommends towing with all wheels **OFF** the ground. Acceptable methods are to tow the vehicle on a flatbed or with one end of vehicle raised and the opposite end on a towing dolly.

2–Wheel Drive Vehicles

Provided that the transmission is operable, tow with the transmission in NEUTRAL and the ignition key in the OFF position along with the front wheels raised and the rear wheels on the ground. Speed must not exceed 30 mph (50 km/h) and distance must not exceed 15 mi (25 km).

CAUTION!

Towing faster than 30 mph (50 km/h) or for more than 15 mi (25 km) can cause severe damage to the transmission.

If the vehicle is to be towed faster than 30 mph (50 km/h) or more than 15 mi (25 km) the vehicle must be towed with the rear wheels raised and the front wheels on the ground. It may also be towed on a flatbed or with the front wheels raised and the rear wheels on a dolly.

MAINTAINING YOUR VEHICLE

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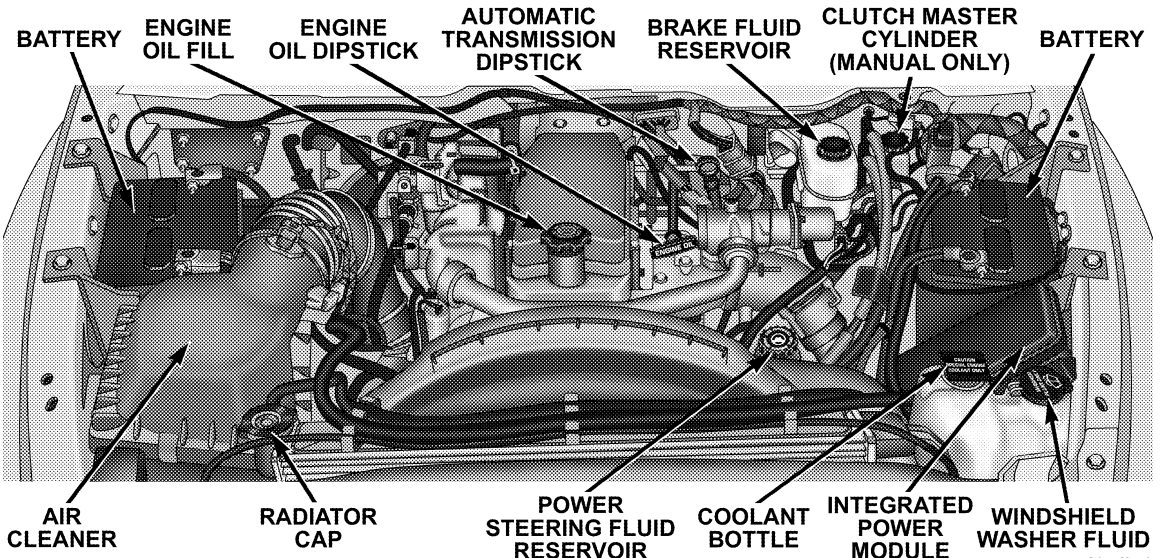
ENGINE COMPARTMENT — 6.7L DIESEL ENGINE



REPLACEMENT PARTS

Use of genuine Sterling® parts for normal/scheduled maintenance and repairs is highly recommended to ensure the designed performance. Damage or failures caused by the use of non-Sterling® parts for maintenance and repairs will not be covered by the manufacturer's warranty.

ENGINE DATA PLATE

Use the information from the engine data plate when discussing service or sourcing parts for your engine. The engine data plate is located on the intake side of the breather cover.

AUTHORIZED DEALER SERVICE

Your authorized dealer has the qualified service personnel, special tools and equipment to perform all service operations in an expert manner. Service manuals are available which include detailed service information for your vehicle. Refer to these manuals before attempting any procedure yourself.

NOTE: Intentional tampering with emissions control systems can result in civil penalties being assessed against you.

WARNING!

You can be badly injured working on or around a motor vehicle. Do only that service work for which you have the knowledge and the proper equipment. If you have any doubt about your ability to perform a service job, take your vehicle to a competent mechanic.

SERVICE INFORMATION

Approved fluids, lubricants and parts are available from your authorized dealer and will help you keep your vehicle operating at its best. Your authorized dealer also has the qualified service personnel, special tools and equipment to perform all service operations in an expert manner. Service manuals are available which include detailed service information for your vehicle. Refer to these manuals before attempting any procedure yourself. See Service Publications information at the back of this manual.

CAUTION!

To maintain your vehicle safely follow these guidelines:

- **Watch your vehicle's mileage and check your Maintenance Schedules regularly for required servicing. Excessive wear or damage to certain vehicle components can result if required services are not performed.**
- **If you have your vehicle undercoated, inspect for undercoating material on the propeller shafts. Such material could cause the shafts to become unbalanced and result in drivetrain vibrations. Remove any undercoating with solvent.**
- **If you have your vehicle undercoated, make sure no undercoating material is sprayed on the exhaust system or components of the seat belt system.**

NOTE: It is not possible for the manufacturer and Cummins, Inc®. to anticipate every possible circumstance that can involve a potential hazard.

WARNING!

To maintain your vehicle safely and avoid personal injury, follow these guidelines:

- **Never spray or pour diesel fuel, flammable liquid or starting fluids (ether) into the air cleaner assembly, air intake piping or turbocharger inlet in an attempt to start the vehicle, unintended engine acceleration may occur.**
- **Do not use alcohol or gasoline as a fuel blending agent. They can be unstable under certain conditions and be hazardous or explosive when mixed with diesel fuel.**
- **If an engine has been operating and the coolant is hot, allow the engine to cool before you slowly loosen the filler cap and relieve the pressure from the cooling system.**
- **To avoid burns, remember that the engine components will stay hot after the engine is shut off.**
- **Do not use gasoline or other flammable materials to clean parts. Always use approved cleaning solvents.**
- **Relieve all pressure in the fuel, oil and cooling systems before any lines, fittings or related items are removed or disconnected. Be alert for possible pressure when disconnecting any device from a system that utilizes pressure. Do not check for pressure leaks with your hand. High pressure oil or fuel can cause personal injury.**
- **Important: All maintenance other than that listed in this manual, as well as some procedures listed here, MUST be performed by your authorized dealer. Your authorized dealer has been trained and has the necessary parts to maintain your engine.**

WARNING!

Do not open the high pressure fuel system with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.

MAINTENANCE PROCEDURES

The pages that follow contain the **required** maintenance services determined by the engineers who designed your vehicle.

Besides the maintenance items for which there are fixed maintenance intervals, there are other items that should operate satisfactorily without periodic maintenance. However, if a malfunction of these items does occur, it could adversely affect the engine or vehicle performance. These items should be inspected if a malfunction is observed or suspected.

Engine Oil

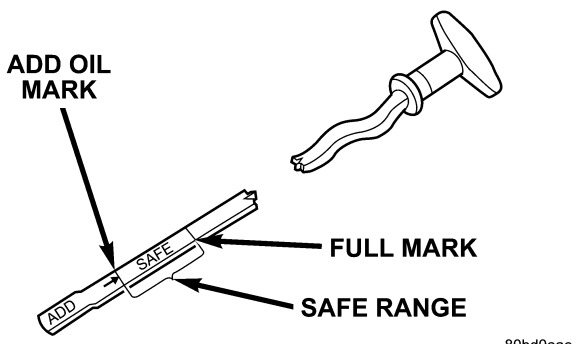
Checking Oil Level

To assure proper lubrication of your vehicle's engine, the engine oil must be maintained at the correct level. Check the oil level at regular intervals. The best time to check the oil level is before starting the engine after it has been parked overnight. When checking oil after operating the engine, first ensure the engine is at full operating temperature, then wait for 30 minutes after engine shutdown to check the oil.

Checking the oil while the vehicle is on level ground will improve the accuracy of the oil level readings. Always maintain the oil level within the SAFE zone on the dipstick. Adding one quart of oil when the reading is at the bottom of the SAFE zone will result in a reading at the top of the safe zone on these engines.

CAUTION!

Overfilling or underfilling the crankcase will cause oil aeration or loss of oil pressure. This could damage your engine.



Engine Oil Dipstick

Never operate the engine with oil level below the "ADD" mark or above the upper "SAFE" mark.

Change Engine Oil (Diesel Engines)
Follow the Diesel Maintenance Schedule for recommended engine oil change intervals.

Engine Oil Selection (Diesel Engines)
For best performance and maximum protection under all types of operating conditions, the manufacturer only recommends engine oils that are API CJ-4. Products meeting Cummins® CES 20081 may also be used. The identification of these engine oils are typically located on the back of the oil container.

American Petroleum Institute (API) Engine Oil Identification Symbol

This symbol means that the oil has been certified by the American Petroleum Institute (API). The manufacturer only recommends API Certified engine oils.

Oils with a high ash content may produce deposits on valves that can progress to guttering and valve burning. A maximum sulfated ash content of 1.00 mass % is recommended for all oil used in the engine.

The same oil change interval is to be followed for synthetic oil as for petroleum based oil. Also, synthetic oil must meet the same performance specifications as petroleum oil.

Engine Oil Viscosity (SAE Grade)

Use SAE 15W-40 Engine Oil that meets the API CJ-4 engine oil category.

Engine oil not designated by Cummins® Material Standards or API CJ-4 should not be used, as engine and exhaust system durability may be compromised. For lower temperature operation SAE 5W-40 engine oils may be used. These oils must meet the same requirements as stated previously. The engine oil filler cap also shows the recommended engine oil viscosity for your engine. For information on engine oil filler cap location, refer to the "Engine Compartment" illustration in this section.

Synthetic Engine Oils

You may use synthetic engine oils provided the recommended oil quality requirements are met, and the recommended maintenance intervals for oil and filter changes are followed.

Materials Added to Engine Oil
The manufacturer strongly recommends against the addition of any additives (other than leak detection dyes or lube odorants) to the engine oil. Engine oil is an engineered product and its performance may be impaired by supplemental additives.

Engine Oil Filter
Refer to "Fluids, Lubricants and Genuine Parts", in this section for the correct part number. The engine oil filter should be changed at **every** engine oil change.

Engine Oil And Filter — Change
Operate the engine until the coolant temperature reaches 140°F (60°C). Shut the engine off. Remove the oil drain plug.

Use a container that can hold at least 12 qts (11.3 L) to hold the used oil.

Always check the condition of the used oil. This can give you an indication of some engine problems that might exist.

- Thin, black oil indicates fuel dilution.
- Milky discoloration indicates coolant dilution.

Clean the area around the oil filter base. Remove the filter from the underside of the vehicle using a cap style oil filter wrench.

Clean the gasket surface of the filter mount. The filter gasket can stick on the filter mount. Make sure it is removed.

Change the engine oil filter with every engine oil change.

Only a high quality filter should be used to assure most efficient service.

CAUTION!

The filtering medium of other aftermarket filters may disintegrate. Debris from failed filters may plug the piston oil cooling nozzles, resulting in scuffed pistons and engine failure.

CAUTION!

Fill the oil filter element with clean oil before installation. Use the same type oil that will be used in the engine. When filling the oil filter, prevent foreign material from falling into the filter. Severe engine damage may occur.

Apply a light film of lubricating oil to the sealing surface of the filter gasket before installing the filter.

CAUTION!

Overtightening may distort the threads or damage the filter element seal.

Install the filter as specified by the filter manufacturer. Turn the filter 3/4 to one full turn after making contact with the gasket.

Check the condition of the threads and sealing surface on the oil pan and drain plug.

Install the drain plug and sealing washer and tighten to 37 ft-lbs. (50 N·m).

Use only high-quality multi-grade lubricating oil in your engine. Choose the correct oil for your operating conditions as outlined in the Selection of Engine Oil.

Fill the engine with the correct grade of new oil.

Start the engine and operate it at idle for several minutes. Check for leaks at the lubricating oil filter and oil pan drain plug.

Run the engine until it has reached operating temperature, stop the engine. Wait approximately 15 minutes to let the oil in the upper parts of the engine drain back to the pan. Check the oil level again.

Add oil as necessary to bring the level to the "SAFE" mark on the dipstick.

Disposing Of Used Engine Oil And Filter
Care should be taken in disposing of the used engine fluids from your vehicle. Used fluids, indiscriminately discarded, can present a problem to the environment. Contact an authorized dealer, service station, or governmental agency for advice on recycling programs and where used fluids and filters can be safely discarded in your area.

Drive Belt (Diesel Engines)

Inspection
Check the belt for intersecting cracks.

- Transverse (across the belt width) cracks are acceptable.
- Longitudinal (direction of belt length) cracks that intersect with transverse cracks are NOT acceptable.

Replace the belt if it has unacceptable cracks, is frayed or has pieces of material missing.

The engine speed sensor, located near the damper, should be inspected for damage if a belt is frayed.

Engine Air Cleaner Filter (Diesel Engines)

CAUTION!

All air entering the engine intake must be filtered. The abrasive particles in unfiltered air will cause rapid wear to engine components.

The condition of the air cleaner filter is monitored by the Engine Control Module. The Electronic Vehicle Information Center (EVIC) will display SERVICE AIR FILTER when service is required.

Do not remove the top of the air filter housing to inspect the filter element on your diesel engine under normal operating conditions.

The EVIC message SERVICE AIR FILTER could be displayed periodically. This is because engine air flow requirements change based on driving conditions. As the filter becomes more restrictive and air flow requirements increase the EVIC message SERVICE AIR FILTER will be displayed. The message may not be displayed in subsequent drive cycles if the same conditions are not met. The air filter element should be replaced within 250 miles from the first time this message is displayed to ensure proper engine operation during all driving conditions.

The air filter housing on your vehicle may also come equipped with a Filter Minder™. This is an air flow restriction gauge that will indicate when the filter element needs to be replaced.

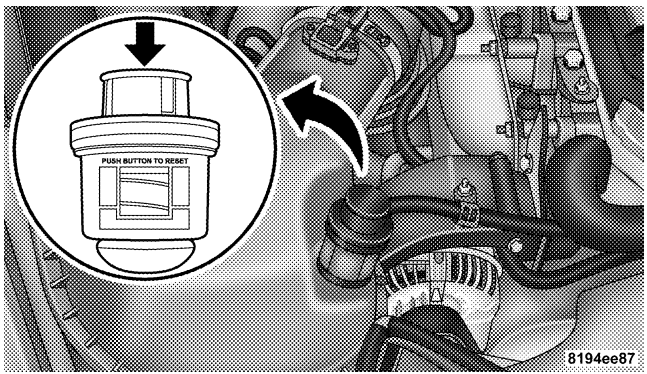
CAUTION!

Driving with a restricted air filter can cause engine damage.

If the vehicle experiences a sudden loss of engine power when being driven in heavy snow, rain or when plowing snow, and the EVIC message center states SERVICE AIR FILTER or the Filter Minder™ (if equipped) is showing a plugged filter, then visually inspect the air filter for snow/ice build up or extreme water saturation. If the air filter is not damaged, remove all snow/ice and reinstall air filter. If the air filter is damaged, replace filter element.

NOTE: The air filter housing contains a Mass Air Flow sensor. This sensor is critical to proper engine operation and component longevity. Any damage or modification to this sensor could result in major engine and/or exhaust aftertreatment damage. This includes the use of non-approved air filters. Use only Sterling® approved air filters or equivalent.

A visual inspection of the air cleaner filter element is never recommended under normal circumstances. A badly restricted element may appear clean while a soiled element may be quite effective in filtering particles without restricting air flow. Rely on the Engine Control Module or the Filter Minder™ (if equipped), to determine when a filter change is necessary.



The clear plastic housing on the Filter Minder™ (If Equipped), allows you to view the amount of air pressure drop across the filter element. It consists of a diaphragm

and a calibrated spring sealed inside the plastic housing. As the air cleaner filter becomes clogged and air pressure drop across the filter element increases, a yellow disc travels along a graduated scale on the side of the Filter Minder™.

The yellow disc will always show the greatest restriction experienced by the filter element. When the disc reaches the red zone, the filter element may need to be replaced. There is no other time or mileage interval for changing the air cleaner filter element.

After a new filter element is inserted, press the rubber button on the top of the Filter Minder™ (if equipped). This action will reset the yellow disc to the clean position.

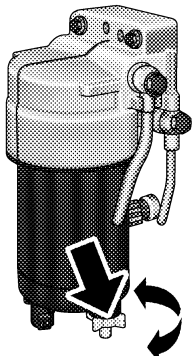
CAUTION!

When using an engine cleaner or a degreaser, be sure to wrap and tape the Filter Minder™ to protect the plastic housing from damage and discoloration.

CAUTION!

Many aftermarket performance air filter elements do not adequately filter the air entering the engine. Use of such filters can severely damage your engine.

Draining Fuel/Water Separator Filter (Diesel Engines)



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Fuel/Water Separator

CAUTION!

Do not drain the fuel/water separator filter when the engine is running.

CAUTION!

Do not prefill the fuel filter when installing a new fuel filter. There is a possibility debris could be introduced into the fuel filter during this action. It is best to install the filter dry and allow the in-tank lift pump to prime the fuel system.

NOTE: The fuel filter and water separator assembly is located on the driver's side of the engine. The best access to the water drain valve is through the driver's side wheel well.

NOTE: Care should be taken in disposing of used fluids from your vehicle. Used fluids, indiscriminately discarded, can present a problem to the environment. Contact an authorized dealer, service station, or government

agency for advice on recycling programs and for where used fluids and filters can be properly disposed of in your area.

Drain a small amount from the fuel/water separator filter monthly or when the WATER IN FUEL indicator light is on. Turn the drain valve, located on the bottom of the filter, counterclockwise and allow any accumulated water to drain. Leave the drain valve open until all water and contaminants have been removed. Close the drain valve by turning it clockwise, when clean fuel is visible.

NOTE: The fuel/water separator drain valve is located on the bottom of the fuel filter housing.

If more than a couple ounces/milliliters of fuel have been drained, follow the directions for "Priming if the engine has run out of fuel."

WARNING!

Do not open the high pressure fuel system with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.

Priming if the engine has run out of fuel

1. Add a substantial quantity of fuel to the tank 5 to 10 gal (19L to 38L).

2. Crank the engine for one to two seconds. If the engine does not start, then release the key or starter button back to the RUN position (do not turn the key back to the OFF position). The electric fuel transfer pump will continue to run and purge air from the system for about 25 seconds. After 25 seconds, attempt to start the engine again.

3. Start the engine using the Normal Starting Procedure.

4. Repeat the procedure if the engine does not start.

CAUTION!

Do not engage the starter motor for more than 15 seconds at a time. Allow two minutes between the cranking intervals.

NOTE: The engine may run rough until the air is forced from all the fuel lines.

CAUTION!

Diesel fuel will damage blacktop paving surfaces. Drain the filter into an appropriate container.

WARNING!

Do not use alcohol or gasoline as a fuel blending agent. They can be unstable under certain conditions and be hazardous or explosive when mixed with diesel fuel.

CAUTION!

Due to lack of lubricants in alcohol or gasoline, the use of these fuels can cause damage to the fuel system.

NOTE: A maximum blend of 5% biodiesel, meeting ASTM specification D-6751 may be used with your Cummins® Diesel equipped vehicle. Use of bio-diesel mixture in excess of 5% can negatively impact the on-engine fuel filter's ability to separate water from the fuel, resulting in high pressure fuel system corrosion or damage.

NOTE: As sufficient testing has not been completed, ethanol blends are not recommended or approved for use with your Cummins® Diesel equipped vehicle.

NOTE: In addition, commercially available fuel additives are not necessary for the proper operation of your Cummins® Diesel equipped vehicle.

Intervention Regeneration Strategy – EVIC Message Process Flow (Catalyst Full Message)

Your new Cummins® 6.7L diesel meets all EPA Heavy Duty Diesel Engine Emissions Standards, resulting in the lowest emitting diesel engine ever produced.

To achieve these emission standards your vehicle is equipped with state of the art engine and exhaust system. The engine and exhaust aftertreatment system work together to achieve the EPA Heavy Duty Diesel Engine Emissions Standards. These systems are seamlessly integrated into your vehicle and managed by the Cummins® 6.7L engine Powertrain Control Module (PCM). The PCM manages engine combustion to allow the exhaust system's catalyst to trap and burn Particulate Matter (PM) pollutants, with no input or interaction on your part.

Additionally, the overhead console in your vehicle has the ability to alert you to additional maintenance required on your vehicle or engine. Refer to the following messages that may be displayed on your Electronic Vehicle Information Center (EVIC):

WARNING!

A hot exhaust system can start a fire if you park over materials that can burn. Such materials might be grass or leaves coming into contact with your exhaust system. Do not park or operate your vehicle in areas where your exhaust system can contact anything that can burn.

Service CCV Filter

The 6.7L Cummins® engine utilizes a Closed Crankcase Ventilation (CCV) system. This system filters and recycles gasses produced in the crankcase during the normal combustion process. "Service CCV Filter" will be displayed on the overhead console of the vehicle if the CCV filter is due for required maintenance. This filter is located on the top of the engine valve cover. For additional information, see an authorized dealer.

Catalyst Full See Owner Manual

"Catalyst Full See Owner Manual" will be displayed on the overhead console of your vehicle if the exhaust particulate filter reaches 80% of its maximum storage capacity. Under conditions of exclusive short duration and low speed driving cycles, your Cummins® engine and exhaust aftertreatment system may never reach the conditions required to remove the trapped Particulate Matter (PM) pollutants; if this occurs "Catalyst Full See Owner Manual" will be displayed on the overhead console in your vehicle. If this message is displayed you will hear one chime to assist in alerting you of this condition.

Catalyst Stat::::::::::80%

"Catalyst Stat::::::::::80%" will replace the message "Catalyst Full See Owner Manual" after it is displayed for one minute. The engine Powertrain Control Module (PCM) will continue to monitor the amount of particulate matter trapped in the particulate filter. This message indicates the percentage of the particulate filter capacity that has been used.

By simply driving your vehicle at highway speeds for as little as 45 minutes you can remedy the condition in the particulate filter system and allow your Cummins® engine and exhaust aftertreatment system to remove the trapped PM and restore the system to normal operating condition.

Catalyst Stat::::::::::80%, 90%, 99%

"Catalyst Stat::::::::::80%, 90%, 99%". If you are unable to drive your vehicle under these conditions for an extended period of time after the initial warning notification, the Engine PCM will continue to monitor the particulate filter and will display the progression of particulate filter usage (80, 90, 99%) on the EVIC message center.

CATALYST FULL SERVICE REQD

If the particulate filter reaches 99% of its capacity the overhead console in your vehicle will chime twice and display the message "CATALYST FULL SERVICE REQD." At this point the engine PCM will register a fault code, the instrument panel will display a MIL light and the engine PCM will derate the vehicle, reducing its horsepower and torque output.

The PCM derates the engine in order to limit the likelihood of permanent damage to the aftertreatment system. If this condition is not corrected and an authorizeddealer service is not performed, extensive exhaust aftertreatment damage can occur. In order to correct this condition it will be necessary to have the vehicle serviced by your local authorized dealer.

Maintenance Free Batteries (Diesel Engines)

The top of the maintenance free batteries are permanently sealed. You will never have to add water, nor is periodic maintenance required.

NOTE: Replacement batteries should both be of equal capacity to prevent damage to the vehicle's charging system.

CAUTION!

It is essential when replacing the cables on the battery that the positive cable is attached to the positive post and the negative cable is attached to the negative post. Battery posts are marked (+) positive and negative (-) and identified on the battery case. Also, if a "fast charger" is used while battery is in vehicle, disconnect both vehicle battery cables before connecting the charger to battery. Do not use a "fast charger" to provide starting voltage.

WARNING!

Battery posts, terminals, and related accessories contain lead and lead compounds. Always wash hands after handling the battery.

Battery Blanket Usage

A battery loses 60% of its cranking power as the battery temperature decreases to 0°F (-18°). For the same decrease in temperature, the engine requires twice as much power to crank at the same RPM. The use of 120 VAC powered battery blankets will greatly increase starting capability at low temperatures.

Air Conditioner Maintenance

For best possible performance, your air conditioner should be checked and serviced by an authorized dealer at the start of each warm season. This service should include cleaning of the condenser fins and a performance test. Drive belt tension should also be checked at this time.

WARNING!

- **Use only refrigerants and compressor lubricants approved by the manufacturer for your air conditioning system. Some unapproved refrigerants are flammable and can explode, injuring you. Other unapproved refrigerants or lubricants can cause the system to fail, requiring costly repairs.**
- **The air conditioning system contains refrigerant under high pressure. To avoid risk of personal injury or damage to the system, adding refrigerant or any repair requiring lines to be disconnected should be done by an experienced repair person.**

NOTE: Use only manufacturer approved A/C system sealers, stop leak products, seal conditioners, compressor oil, or refrigerants.

Refrigerant Recovery and Recycling

R-134a air conditioning refrigerant is a hydrofluorocarbon (HFC) that is endorsed by the Environmental Protection Agency and is an ozone-saving product. However, the manufacturer recommends that air conditioning service be performed by authorized dealers or other service facilities using recovery and recycling equipment.

Power Steering — Fluid Check

Checking the power steering fluid level at a defined service interval is not required. The fluid should only be checked if a leak is suspected, abnormal noises are apparent, and/or the system is not functioning as anticipated.

WARNING!

Fluid level should be checked on a level surface and with the engine off to prevent injury from moving parts and to ensure accurate fluid level reading. Do not overfill. Use only manufacturer's recommended power steering fluid.

If necessary, add fluid to restore to the proper indicated level. With a clean cloth, wipe any spilled fluid from all surfaces. Refer to "Fluids, Lubricants, and Genuine Parts" in this section for correct fluid type.

Front Suspension Ball Joints

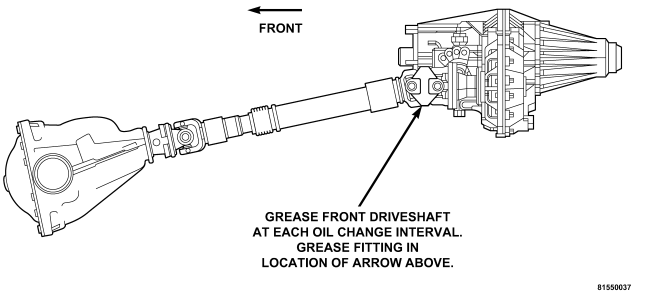
The ball joints originally supplied with the vehicle are permanently lubricated at the factory and do not require service. The ball joints and seals should be inspected whenever the vehicle is serviced for other reasons.

Steering Linkage — Inspection

Whenever the vehicle is hoisted, all steering linkage joints should be inspected for evidence of damage. If seals are damaged, parts should be replaced to prevent leakage or contamination of the grease.

Front Prop Shaft Lubrication

Lubricate the front driveshaft grease fitting at each oil change listed in the appropriate Maintenance Schedule for your vehicle. Use lithium based grease or equivalent.



Front Driveshaft Grease Fitting

Front Axle Universal Drive Joints And Ball Joints

The front axle universal joint and ball joints are permanently lubricated and do not require servicing.

Body Lubrication

Locks and all body pivot points, including such items as seat tracks, doors, liftgate, tailgate, sliding doors and hood hinges, should be lubricated periodically to assure quiet, easy operation and to protect against rust and wear. Prior to the application of any lubricant, the parts concerned should be wiped clean to remove dust and grit; after lubricating excess oil and grease should be removed. Particular attention should also be given to hood latching components to ensure proper function. When performing other underhood services, the hood latch, release mechanism and safety catch should be cleaned and lubricated. The external lock cylinders should be lubricated twice a year, preferably in the Fall and Spring. Apply a small amount of a high quality lock lubricant directly into the lock cylinder.

Windshield Wiper Blades

The rubber edges of the wiper blades and the windshield should be cleaned periodically with a sponge or soft cloth and a mild nonabrasive cleaner. This will remove accumulations of salt or road film.

Operation of the wipers on dry glass for long periods may cause deterioration of the wiper blades. Always use washer fluid when using the wipers to remove salt or dirt from a dry windshield.

Avoid using the wiper blades to remove frost or ice from the windshield. Keep the blade rubber out of contact with petroleum products such as engine oil, gasoline, etc.

Windshield Washers

The fluid reservoir is located under the hood and should be checked for fluid level at regular intervals. Fill the reservoir with windshield washer solvent only (not radiator antifreeze). When refilling the washer fluid reservoir, take some washer fluid and apply it to a cloth or towel and wipe clean the wiper blades; this will help blade performance.

To prevent freeze-up of your windshield washer system in cold weather, select a solution or mixture that meets or exceeds the temperature range of your climate. This rating information can be found on most washer fluid containers.

The washer fluid reservoir will hold a full gallon/liter of fluid when the Low Washer Fluid Light illuminates.

WARNING!

Commercially available windshield washer solvents are flammable. They could ignite and burn you. Care must be exercised when filling or working around the washer solution.

After the engine has warmed, operate the defroster for a few minutes to reduce the possibility of smearing or freezing the fluid on the cold windshield. All-weather windshield washer solution, used as directed on the container, aids cleaning action, reduces the freezing point to avoid line clogging, and is not harmful to paint or trim.

Exhaust System

The best protection against carbon monoxide entry into the vehicle body is a properly maintained engine exhaust system.

Whenever a change is noticed in the sound of the exhaust system, when exhaust fumes can be detected inside the vehicle, or when the underside or rear of the vehicle is damaged, have a competent mechanic inspect the complete exhaust system and adjacent body areas for broken, damaged, deteriorated, or mispositioned parts. Open seams or loose connections could permit exhaust fumes to seep into the passenger compartment. In addition, inspect the exhaust system each time the vehicle is raised for lubrication or oil change. Replace parts as required.

WARNING!

Exhaust gases can injure or kill. They contain carbon monoxide (CO) which is colorless and odorless. Breathing it can make you unconscious and can eventually poison you. To avoid breathing CO, follow the preceding safety tips.

Exhaust System Rubber Isolator and Loop-Type Hanger — If Equipped

Inspect surfaces whenever the vehicle is hoisted for rubber to metal separation or deep cracks. If, however, excessively deep localized cracks are present, or any part of the exhaust system abnormally contacts the underbody hardware, the isolator and/or hanger should be replaced.

Cooling System

WARNING!

You or others can be badly burned by hot coolant or steam from your radiator. If you see or hear steam coming from under the hood, don't open the hood until the radiator has had time to cool. Never try to open a cooling system pressure cap when the radiator is hot.

Engine Coolant Checks

Check the engine coolant (antifreeze) protection every 12 months (before the onset of freezing weather, where applicable). If coolant is dirty or rusty in appearance, the system should be drained, flushed and refilled with fresh coolant. Check the front of the A/C condenser for any accumulation of bugs, leaves, etc. If dirty, clean by gently spraying water from a garden hose vertically down the face of the condenser.

Check the coolant recovery bottle tubing for brittle rubber, cracking, tears, cuts and tightness of the connection at the bottle and radiator. Inspect the entire system for leaks.

With the engine at normal operating temperature (but not running), check the cooling system pressure cap for proper vacuum sealing by draining a small amount of coolant from the radiator drain cock. If the cap is sealing properly, the engine coolant (antifreeze) will begin to drain from the coolant recovery bottle. DO NOT REMOVE THE COOLANT PRESSURE CAP WHEN THE COOLING SYSTEM IS HOT.

Cooling System — Drain, Flush and Refill
At the intervals shown on the Maintenance Schedules, the system should be drained, flushed and refilled.

If the solution is dirty or contains a considerable amount of sediment, clean and flush with a reliable cooling system cleaner. Follow with a thorough rinsing to remove all deposits and chemicals. Properly dispose of old antifreeze solution.

Selection Of Coolant
Use only the manufacturers recommended coolant, refer to "Fluids, Lubricants and Genuine Parts" in this section for correct coolant type.

CAUTION!

- **Mixing of coolants other than specified HOAT engine coolants, may result in engine damage and may decrease corrosion protection. If a non-HOAT coolant is introduced into the cooling system in an emergency, it should be replaced with the specified coolant as soon as possible.**
- **Do not use plain water alone or alcohol-base engine coolant (antifreeze) products. Do not use additional rust inhibitors or antirust products, as they may not be compatible with the radiator engine coolant and may plug the radiator.**
- **This vehicle has not been designed for use with Propylene Glycol based coolants. Use of Propylene Glycol based coolants is not recommended.**

Adding Coolant

Your vehicle has been built with an improved engine coolant that allows extended maintenance intervals. This coolant can be used up to 5 Years or 100,000 mi (160 000 km) before replacement. To prevent reducing this extended maintenance period, it is important that you use the same coolant throughout the life of your vehicle. Please review these recommendations for using Hybrid Organic Additive Technology (HOAT) coolant. When adding coolant:

- The manufacturer recommends using antifreeze/coolant with a 5–year/100,000–mile formula HOAT (Hybrid Organic Additive Technology).
- Mix a minimum solution of 50% HOAT engine coolant and distilled water. Use higher concentrations (not to exceed 70%) if temperatures below -34°F (-37°C) are anticipated.
- Use only high purity water such as distilled or deionized water when mixing the water/engine coolant solution. The use of lower quality water will reduce the amount of corrosion protection in the engine cooling system.

Please note that it is the owner's responsibility to maintain the proper level of protection against freezing according to the temperatures occurring in the area where the vehicle is operated.

NOTE: Mixing coolant types will decrease the life of the engine coolant and will require more frequent coolant changes.

Cooling System Pressure Cap

The cap must be fully tightened to prevent loss of coolant, and to ensure that coolant will return to the radiator from the coolant recovery bottle.

The cap should be inspected and cleaned if there is any accumulation of foreign material on the sealing surfaces.

WARNING!

- **The warning words "DO NOT OPEN HOT" on the cooling system pressure cap are a safety precaution. Never add coolant when the engine is overheated. Do not loosen or remove the cap to cool an overheated engine. Heat causes pressure to build up in the cooling system. To prevent scalding or injury, do not remove the pressure cap while the system is hot or under pressure.**
- **Do not use a pressure cap other than the one specified for your vehicle. Personal injury or engine damage may result.**

Disposal of Used Engine Coolant

Used ethylene glycol based engine coolant is a regulated substance requiring proper disposal. Check with your local authorities to determine the disposal rules for your community. To prevent ingestion by animals or children do not store ethylene glycol based engine coolant in open containers or allow it to remain in puddles on the ground. If ingested by a child, contact a physician immediately. Clean up any ground spills immediately.

Coolant Level

The coolant bottle provides a quick visual method for determining that the coolant level is adequate. With the engine cold, the level of the coolant in the coolant recovery bottle should be between the ranges indicated on the bottle.

The radiator normally remains completely full, so there is no need to remove the radiator cap unless checking for coolant freeze point or replacing coolant. Advise your

service attendant of this. As long as the engine operating temperature is satisfactory, the coolant bottle need only be checked once a month.

When additional coolant is needed to maintain the proper level, it should be added to the coolant bottle. Do not overfill.

Points To Remember

NOTE: When the vehicle is stopped after a few miles (a few kilometers) of operation, you may observe vapor coming from the front of the engine compartment. This is normally a result of moisture from rain, snow, or high humidity accumulating on the radiator and being vaporized when the thermostat opens, allowing hot coolant to enter the radiator.

If an examination of your engine compartment shows no evidence of radiator or hose leaks, the vehicle may be safely driven. The vapor will soon dissipate.

- Do not overfill the coolant recovery bottle.
- Check coolant freeze point in the radiator and in the coolant recovery bottle. If antifreeze needs to be added, contents of coolant recovery bottle must also be protected against freezing.
- If frequent coolant additions are required, or if the level in the coolant recovery bottle does not drop when the engine cools, the cooling system should be pressure tested for leaks.
- Maintain coolant concentration at 50% HOAT engine coolant (minimum) and distilled water for proper corrosion protection of your engine, which contains aluminum components.
- Make sure that the radiator and coolant recovery bottle overflow hoses are not kinked or obstructed.

- Keep the front of the radiator clean. If your vehicle is equipped with air conditioning, keep the front of the condenser clean, also.
- Do not change the thermostat for summer or winter operation. If replacement is ever necessary, install ONLY the correct type thermostat. Other designs may result in unsatisfactory coolant performance, poor gas mileage, and increased emissions.

Fan

Inspection

Check the fan for cracks and bent or broken blades. If any of these conditions exist, you must replace the fan. Make sure it is securely mounted.

NOTE: This service procedure must be performed by a trained service technician. Make arrangements with your authorized dealer for this inspection.

Charge Air Cooler — Inter-Cooler

The charge air cooler is positioned between the radiator and the air conditioner condenser. Air enters the engine through the air cleaner and passes through the turbocharger, where it is pressurized. This pressurized air rapidly reaches high temperature. The air is then directed through a hose to the charge air cooler and through another hose to the intake manifold of the engine. The air entering the engine has been cooled by about 50° to 100°F (10° to 38°C). This cooling process enables more efficient burning of fuel resulting in fewer emissions.

To guarantee optimum performance of the system, keep the surfaces of the charge air cooler, condenser and radiator clean and free of debris. Periodically check the hoses leading to and from the charge air cooler for cracks or loose clamps resulting in loss of pressure and reduced engine performance.

Hoses And Vacuum/Vapor Harnesses

Inspect surfaces of hoses and nylon tubing for evidence of heat and mechanical damage. Hard or soft spots, brittle rubber, cracking, tears, cuts, abrasions, and excessive swelling indicate deterioration of the rubber.

Pay particular attention to those hoses nearest to high heat sources such as the exhaust manifold. Inspect hose routing to be sure hoses do not come in contact with any heat source or moving component which may cause heat damage or mechanical wear.

Ensure nylon tubing in these areas has not melted or collapsed.

Inspect all hose connections such as clamps and couplings to make sure they are secure and no leaks are present.

Components should be replaced immediately if there is any evidence of wear or damage that could cause failure.

Fuel System Connections

Electronic Fuel Injection high pressure fuel systems are designed with tubes and special connects, connections and clamps which have unique material characteristics to provide adequate sealing and resist attack by deteriorated gasoline.

You are urged to use only the manufactures-specified tubes, connections and clamps, or their equivalent in material and specification, in any fuel system servicing.

Brake System

Power Disc Brakes (Front and Rear)

Disc brakes do not require adjustment; however, several hard stops during the break-in period are recommended to seat the linings and wear off any foreign material.

Brake And Power Steering Hoses

When the vehicle is serviced for scheduled maintenance, inspect surface of hoses and nylon tubing for evidence of

heat and mechanical damage. Hard and brittle rubber, cracking, tears, cuts, abrasion, and excessive swelling indicate deterioration of the rubber. Particular attention should be made to examining those hose surfaces nearest to high heat sources, such as the exhaust manifold.

Ensure nylon tubing in these areas has not melted or collapsed.

Inspect all hose connections such as clamps and couplings to make sure they are secure and no leaks are present.

NOTE: Often, fluid such as oil, power steering fluid, and brake fluid are used during assembly plant operations to facilitate the assembly of hoses to couplings. Therefore, oil wetness at the hose-coupling area is not necessarily an indication of leakage. Actual dripping of hot fluid when systems are under pressure (during vehicle operation) should be noted before hose is replaced based on leakage.

NOTE: Inspection of brake hoses should be performed whenever the brake system is serviced and every engine oil change. Inspect hydraulic brake hoses for surface cracking, scuffing, or worn spots. If there is any evidence of cracking, scuffing, or worn spots, the hose should be replaced immediately! Eventual deterioration of the hose can take place, resulting in a possibility of a burst failure.

WARNING!

Worn brake hoses can burst and cause brake failure. You could have an accident. If you see any signs of cracking, scuffing, or worn spots, have the brake hoses replaced immediately.

Brake Master Cylinder – Brake Fluid Level Check
The fluid level of the master cylinder should be checked when performing under the hood service, or immediately if the brake system warning lamp indicates system failure.

The brake master cylinder has a translucent plastic reservoir. On the outboard side of the reservoir, there is a "MAX" mark and a "MIN" mark. The fluid level must be kept within these two marks. Do not add fluid above the full mark because leakage may occur at the cap.

With disc brakes the fluid level can be expected to fall as the brake linings wear. However, an unexpected drop in fluid level may be caused by a leak and a system check should be conducted.

Refer to "Fluids, Lubricants and Genuine Parts" in this section for the correct Fluid type.

WARNING!

Use of a brake fluid that may have a lower initial boiling point, or unidentified as to specification, may result in sudden brake failure during hard prolonged braking. You could have an accident.

WARNING!

Overfilling the brake fluid reservoir can result in spilling brake fluid on hot engine parts and the brake fluid catching fire.

Use only brake fluid that has been in a tightly closed or sealed container to avoid contamination from foreign matter or moisture.

CAUTION!

Do not allow a petroleum-based fluid to contaminate the brake fluid. Seal damage and loss of brake performance may result.

Clutch Hydraulic System

The clutch hydraulic system is a sealed maintenance-free system. In the event of leakage or other malfunction, the system must be replaced.

Clutch Linkage

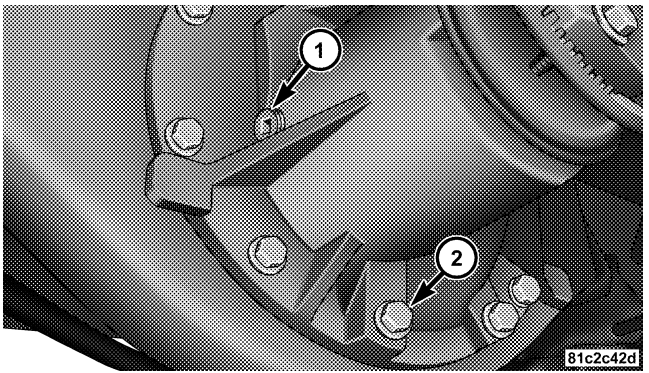
If the clutch pedal linkage begins to squeak or grunt, the clutch pedal pivot bushings should be lubricated. Refer to "Fluids, Lubricants and Genuine Parts" in this section for the correct lubricant type: Multipurpose Grease, NLGI Grade 2 E.P.

Rear Axle And 4x4 Front Driving Axle Fluid Level

When checking the fluid level, the vehicle should be in a level position. The fluid level should be 1/4 in ± 1/4 in (6.4 mm ± 6.4 mm) below the fill hole on the front axle. The fluid level should be level with the bottom of the fill hole on the rear axle.

Drain And Refill

Remove the lower bolt to drain the axle fluid.



1 — Rear Axle Fluid Fill Plug
2 — Rear Axle Fluid Drain Plug

Follow the appropriate Maintenance Schedule for recommended front and rear axle fluid change intervals.

Lubricant Selection

For the correct Fluid type, refer to "Fluids, Lubricants and Genuine Parts" in this Section.

NOTE: The presence of water in the gear lubricant will result in corrosion and possible failure of differential components. Operation of the vehicle in water, as may be encountered in some off-highway types of service, will require draining and refilling the axle to avoid damage.

Limited-Slip Differentials DO NOT REQUIRE any limited slip oil additive (friction modifiers).

NOTE: Slight noise and mild shuddering may be evident while turning a vehicle with limited slip differential on concrete or dry pavement. These conditions should be considered normal operation of the limited slip differential.

Transfer Case — If Equipped

Drain And Refill

Follow the appropriate Maintenance Schedule for recommended transfer case fluid change intervals.

Lubricant Selection

For the correct Fluid type, refer to "Fluids, Lubricants and Genuine Parts" in this Section.

Fluid Level Check

This fluid level can be checked by removing the filler plug. The fluid level should be to the bottom edge of the filler plug hole with the vehicle in a level position.

Manual Transmission — If Equipped

Lubricant Selection for 6-Speed Manual Transmission — If Equipped

If it becomes necessary to add fluid or change the fluid, be sure to use the same lubricant or equivalent. For the correct Fluid type, refer to "Fluids, Lubricants and Genuine Parts" in this Section.

Follow the Maintenance Schedule for recommended transmission fluid change intervals.

Fluid Level Check

This fluid level can be checked by removing the filler plug. If the level of the lubricant is more than 1/4 in (6.4 mm) below the bottom of the filler hole while the vehicle is on level ground, enough lubricant should be added to bring the level to the bottom of the filler hole.

Automatic Transmission

Selection Of Lubricant

It is important that the proper lubricant is used in the transmission to assure optimum transmission performance. Use only manufacturer's recommended transmission fluid; for the correct Fluid type, refer to "Fluids, Lubricants and Genuine Parts" in this Section. It is important that the transmission fluid be maintained at the prescribed level using the recommended fluid.

CAUTION!

Using a transmission fluid other than the manufacturer's recommended fluid may cause deterioration in transmission shift quality and/or torque converter shudder. Using a transmission fluid other than the manufacturer's recommended fluid will result in serious damage to the transmission. Refer to "Fluids, Lubricants and Genuine Parts" in this section for correct fluid type.

Fluid Level Check – AS68RC Transmission
Check the fluid level while the transmission is at normal operating temperature 167°F (76°C). This occurs after at least 15 mi (25 km) of driving. At normal operating temperature the fluid cannot be held comfortably between the fingertips.

Procedure For Checking Fluid Level
To properly check the automatic transmission fluid level, the following procedure must be used:

1. The vehicle must be on level ground.

2. Operate the engine at idle speed for a minimum of 60 seconds and normal operating temperature.

3. Fully apply parking brake and press the brake pedal.

4. Place the shift lever momentarily in each gear position ending with the lever in PARK. Make sure the engine is running at idle speed.

5. Remove the dipstick and determine if the fluid is hot or cold. Hot fluid is approximately 160°F - 175°F (70°C - 82°C), Which is the normal operating temperature after the vehicle has been driven at least 15 mi (24 km). The fluid can not be comfortably held between the finger tips. Only use the cold region on the dipstick as a rough reference when doing initial oil level set after transmission rebuild or transmission refill.

6. Wipe the dipstick clean and reinsert it until seated.

7. Remove the dipstick again and note the fluid level on both sides. The fluid level should be between the HOT (upper) reference holes on the dipstick at normal operating temperature. Verify that a solid coating of oil is seen on both sides of the dipstick. If the fluid is low, add Mobil® ATF 3309 as required into the dipstick tube. **Do not overfill. Never use any ATF other than Mobil® ATF 3309 or Mopar AS68RC ATF.** After adding any quantity

of oil through the dipstick tube, wait a minimum of two minutes for the oil to fully drain into the transmission before rechecking the fluid level.

NOTE: If it is necessary to check the transmission below the operating temperature, the fluid level should be between the two cold (lower) holes on the dipstick with the fluid at approximately 70°F - 85°F (20°C - 30°C). If the fluid level is correctly established at room temperature, it should be between the HOT (upper) reference holes when the transmission reaches 160°F - 175°F (70°C - 82°C). Remember it is best to check the level at the normal operating temperature.

CAUTION!

Be aware that if the fluid temperature is below 50°F (10°C), it may not register on the dipstick. Do not add fluid until the temperature is elevated enough to produce an accurate reading. Never use any ATF other than Mobil® ATF 3309.

8. Check for leaks. Release the parking brake.

NOTE: To prevent dirt and water from entering the transmission after checking or replenishing fluid, make certain that the dipstick cap is properly reseated. It is normal for the dipstick cap to spring back slightly from its fully seated positions, as long as its seal remains engaged in the dipstick tube.

Automatic Transmission Fluid and Filter Change
To obtain best performance and long life for automatic transmissions, the manufacturer recommends that they be given regular maintenance service by an authorized dealer or service center. It is important that the transmission fluid is maintained at the correct level, and that it be drained and refilled as specified.

The fluid and filter(s) should be changed as specified in the Maintenance Schedule (Section 8).

NOTE: If the transmission is disassembled for any reason, the fluid and filter should be changed, and the bands adjusted (if equipped).

It is important that proper lubricant is used in the transmission. For the correct Fluid type, refer to "Fluids, Lubricants and Genuine Parts" in this Section. A filter change should be made at the time of the oil change.

Special Additives
Automatic Transmission Fluid (ATF) is an engineered product and its performance may be impaired by supplemental additives. Therefore, do not add any fluid additives to the transmission. The only exception to this policy is the use of special dyes to aid in detecting fluid leaks. In addition, avoid using transmission sealers as they may adversely affect seals.

Front and Rear Wheel Bearings

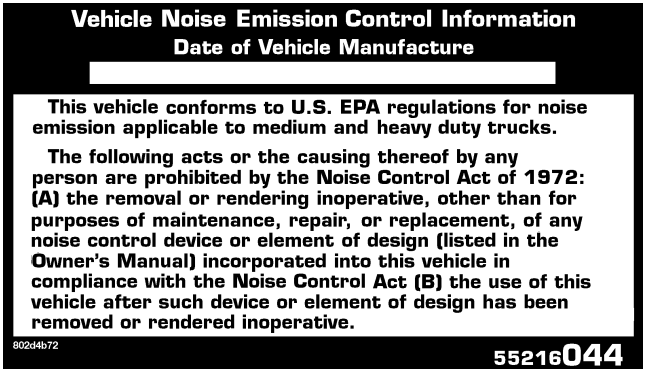
Front Wheel Bearings
Front wheel bearings for all vehicles are sealed-for-life. They do not require greasing or seal replacement. In some instances, these bearings will "purge" excess grease and the bearing will look slightly wet. This is normal. Periodic inspection for excess play is recommended.

Rear Wheel Bearings — Manufacturer's Axles
These bearings are normally considered permanently lubricated. Cleaning and repacking is required only when axle shafts are removed or in case of extreme water or dust contamination.

Noise Control System Required Maintenance & Warranty

For 4500/5500 2-Wheel Drive and 4-Wheel Drive models over 10,000 lbs. (4 535 kg) Gross Vehicle Weight Rating.

All vehicles built over 10,000 lbs. (4 535 kg) Gross Vehicle Weight Rating and manufactured for sale and use in the United States are required to comply with the Federal Government's Exterior Noise Regulations. These vehicles can be identified by the Noise Emission Control Label located in the operator's compartment.


Vehicle Noise Emission Control Information
Date of Vehicle Manufacture
This vehicle conforms to U.S. EPA regulations for noise emission applicable to medium and heavy duty trucks.
The following acts or the causing thereof by any person are prohibited by the Noise Control Act of 1972: (A) the removal or rendering inoperative, other than for purposes of maintenance, repair, or replacement, of any noise control device or element of design (listed in the Owner's Manual) incorporated into this vehicle in compliance with the Noise Control Act (B) the use of this vehicle after such device or element of design has been removed or rendered inoperative.
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Required Maintenance For Noise Control Systems
The following maintenance services must be performed every six months or 6,000 mi (9 600 km) whichever comes first, to assure proper operation of the noise control systems. In addition, inspection and service should be

performed anytime a malfunction is observed or suspected. Proper maintenance of the entire vehicle will help the effectiveness of the noise control systems.

Exhaust System
Inspect the entire exhaust system for leaks and damaged parts. Devices such as hangers, clamps, and U-bolts should be tight and in good condition. Damaged components, burned or blown out mufflers, burned or rusted out exhaust pipes should be replaced according to the procedures and specifications outlined in the appropriate service manual.

Air Cleaner Assembly
Inspect air cleaner housing for proper assembly and fit. Make certain that the air cleaner is properly positioned and that the cover is tight. Check all hoses leading to the air cleaner for tightness. The air filter element must also be clean and serviced according to the instructions outlined in the Maintenance Schedule Section of this manual.

Tampering With Noise Control System Prohibited
Federal law prohibits the following acts or the causing thereof: (1) the removal or rendering inoperative by any person, other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below.

- **AIR CLEANER**
  - Removal of the air cleaner.
  - Removal of the air cleaner filter element from the air cleaner housing.
  - Removal of the air ducting.

- **EXHAUST SYSTEM**
  - Removal or rendering inoperative exhaust system components including the muffler or tailpipe.
- **ENGINE COOLING SYSTEM**
  - Removal or rendering inoperative the fan clutch.
  - Removal of the fan shroud.

Noise Emission Warranty

The manufacturer warrants that this vehicle as manufactured by the manufacturer, was designed, built and equipped to conform at the time it left the manufacturer's control with all applicable U.S. EPA Noise Control Regulations.

This warranty covers this vehicle as designed, built and equipped by the manufacturer, and is not limited to any particular part, component or system of the vehicle manufactured by the manufacturer. Defects in design, assembly or in any part, component or system of the vehicle as manufactured by the manufacturer, which, at the time it left the manufacturer's control, caused noise emissions to exceed Federal standards, are covered by this warranty for the life of the vehicle.

Maintenance Log and Service Chart

Noise Systems Maintenance Chart and Service Log — Insert Month, Day, Year under column mileage closest to the mileage at which service was performed.								
MILES KILOMETERS	7,500 12 000	15,000 24 000	22,500 36 000	30,000 48 000	37,500 60 000	45,000 72 000	52,500 84 000	60,000 96 000
Exhaust system-inspect								
Air cleaner assembly-inspect								
ODOMETER READING								
PERFORMED BY								
PERFORMED AT								

MILES KILOMETERS	67,500 108 000	75,000 120 000	82,500 132 000	90,000 144 000	97,500 126 000	84,000 156 000	105,00 168 000	112,500 181 000
Exhaust system-inspect								
Air cleaner assembly-inspect								
ODOMETER READING								
PERFORMED BY								
PERFORMED AT								

Appearance Care and Protection from Corrosion

Protection of Body and Paint from Corrosion

Vehicle body care requirements vary according to geographic locations and usage. Chemicals that make roads passable in snow and ice, and those that are sprayed on trees and road surfaces during other seasons, are highly corrosive to the metal in your vehicle. Outside parking, which exposes your vehicle to airborne contaminants, road surfaces on which the vehicle is operated, extreme hot or cold weather and other extreme conditions will have an adverse affect on paint, metal trim, and underbody protection.

The following maintenance recommendations will enable you to obtain maximum benefit from the corrosion resistance built into your vehicle.

What Causes Corrosion?

Corrosion is the result of deterioration or removal of paint and protective coatings from your vehicle.

The most common causes are:

- Road salt, dirt and moisture accumulation.
- Stone and gravel impact.
- Insects, tree sap and tar.
- Salt in the air near seacoast localities.
- Atmospheric fallout/industrial pollutants.

Washing

- Wash your vehicle regularly. Always wash your vehicle in the shade using a mild car wash soap, and rinse the panels completely with clear water.
- If insects, tar or other similar deposits have accumulated on your vehicle, use a bug and tar remover to remove.

- Use a cleaner wax to remove road film, stains and to protect your paint finish. Take care never to scratch the paint.
- Avoid using abrasive compounds and power buffing that may diminish the gloss or thin out the paint finish.

CAUTION!

Do not use abrasive or strong cleaning materials such as steel wool or scouring powder, which will scratch metal and painted surfaces.

Special Care

- If you drive on salted or dusty roads, or if you drive near the ocean, hose off the undercarriage at least once a month.
- It is important that the drain holes in the lower edges of the doors, rocker panels and trunk be kept clear and open.
- If you detect any stone chips or scratches in the paint, touch them up immediately. The cost of such repairs is considered the responsibility of the owner.
- If your vehicle is damaged due to an accident or similar cause which destroys the paint and protective coating, have your vehicle repaired as soon as possible. The cost of such repairs is considered the responsibility of the owner.
- If you carry special cargo such as chemicals, fertilizers, de-icer salt, etc., be sure that such materials are well packaged and sealed.
- If a lot of driving is done on gravel roads, consider mud or stone shields behind each wheel.

- Use touch up paint on scratches as soon as possible. Your authorized dealer has touch up paint to match the color of your vehicle.

Wheel and Wheel Trim Care

All wheels and wheel trim, especially aluminum and chrome plated wheels should be cleaned regularly with a mild soap and water to prevent corrosion. To remove heavy soil and/or excessive brake dust, use a nonabrasive, non-acidic cleaner. Do not use scouring pads, steel wool, a bristle brush, or metal polishes. Do not use oven cleaner. Avoid automatic car washes that use acidic solutions or harsh brushes that may damage the wheels' protective finish.

YES Essentials® Fabric Cleaning Procedure – If equipped

YES Essentials® seats may be cleaned in the following manner:

- Remove as much of the stain as possible by blotting with a clean, dry towel.
- Blot any remaining stain with a clean, damp towel.
- For tough stains, apply a mild soap solution to a clean, damp cloth and remove stain. Use a fresh, damp towel to remove soap residue.
- For grease stains, apply a multipurpose cleaner to a clean, damp cloth and remove stain. Use a fresh, damp towel to remove soap residue.
- Do not use any solvents or protectants on YES Essentials® products.

Interior Care

Use a mild soap solution to clean fabric upholstery and carpeting.

Use a mild soap solution to clean vinyl and leather upholstery.

Your leather upholstery can be best preserved by regular cleaning with a damp soft cloth. Small particles of dirt can act as an abrasive and damage the leather upholstery and should be removed promptly with a damp cloth. Stubborn soils can be removed easily with a soft cloth and a mild soap solution. Care should be taken to avoid soaking your leather upholstery with any liquid. Please do not use polishes, oils, cleaning fluids, solvents, detergents, or ammonia-based cleaners to clean your leather upholstery. Application of a leather conditioner is not required to maintain the original condition.

WARNING!

Do not use volatile solvents for cleaning purposes. Many are potentially flammable, and if used in closed areas they may cause respiratory harm.

Cleaning Headlights

Your vehicle has plastic headlights that are lighter and less susceptible to stone breakage than glass headlights.

Plastic is not as scratch resistant as glass and therefore different lens cleaning procedures must be followed.

To minimize the possibility of scratching the lenses and reducing light output, avoid wiping with a dry cloth. To remove road dirt, wash with a mild soap solution followed by rinsing.

Do not use abrasive cleaning components, solvents, steel wool or other aggressive material to clean the lenses.

Glass Surfaces

All glass surfaces should be cleaned on a regular basis with a commercial household-type glass cleaner. Never use an abrasive type cleaner. Use caution when cleaning the inside rear window equipped with electric defrosters or the right rear quarter window equipped with the radio antenna. Do not use scrapers or other sharp instruments which may scratch the elements. When cleaning the rearview mirror, spray cleaner on the towel or rag that you are using. Do not spray cleaner directly on the mirror.

Cleaning Plastic Instrument Cluster Lenses

The lenses in front of the instruments in this vehicle are molded in clear plastic. When cleaning the lenses, care must be taken to avoid scratching the plastic.

1. Clean with a wet soft rag. A mild soap solution may be used, but do not use high alcohol content or abrasive cleaners. If soap is used, wipe clean with a clean damp rag.

2. Dry with a soft tissue.

Seat Belt Maintenance

Do not bleach, dye or clean the belts with chemical solvents or abrasive cleaners. This will weaken the fabric. Sun damage can also weaken the fabric.

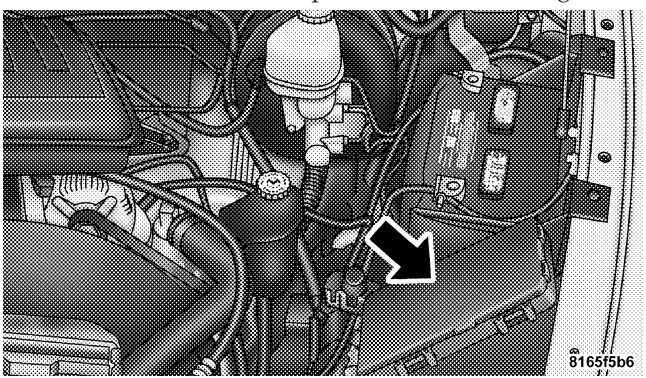
If the belts need cleaning, use a mild soap solution or lukewarm water. Do not remove the belts from the vehicle to wash them.

Replace the belts if they appear frayed or worn or if the buckles do not work properly.

Dry with a soft tissue.

FUSES (INTEGRATED POWER MODULE)

An integrated power module is located in the engine compartment near the battery. This center contains cartridge fuses and mini fuses. A description of each fuse and component may be stamped on the inside cover, otherwise the cavity number of each fuse is stamped on the inside cover that corresponds to the following chart.



Integrated Power Module Location

Cavity	Cartridge Fuse	Mini Fuse	Description
1		20 Amp Yellow	Power Outlet Console
2		20 Amp Yellow	Cabin Compartment Node (CCN) Door Locks
3		—	—
4		15 Amp Blue	Aisin Transmission Controls
5		20 Amp Yellow	Power Sunroof
6		10 Amp Red	Vistronic Fan/ Wastegate Solenoid
7		—	—
8		10 Amp Red	Heated Mirrors

Cavity	Cartridge Fuse	Mini Fuse	Description
9	30 Amp Pink		Off Road Module Power
10		—	—
11		20 Amp Yellow	Ignition Off Draw (IOD)-Cabin Compartment Node (CCN)/Radio/Under Hood Lamp/Wireless Control Module (WCM)/Satellite Digital Audio Receiver (SDARS)/Hands Free Module (HFM)/EOM
12	30 Amp Pink		Electric Brake
13		25 Amp Natural	Power-Battery RWAL/ABS Module Feed
14		15 Amp Blue	Park Lights Left
15		20 Amp Yellow	Trailer Park Lights
16		15 Amp Blue	Park Lights Right
17		—	—
18	40 Amp Green		ABS Pump
19	30 Amp Pink		Trailer Tow Battery Feed
20		10 Amp Red	Occupant Restraints Controller (ORC) 2

Cavity	Cartridge Fuse	Mini Fuse	Description
21		10 Amp Red	Occupant Restraints/ Pass Disable Switch
22		2 Amp Gray	IGN Switch Feed
23		10 Amp Red	HVAC
24	20 Amp Blue		AISIN Relay Feed
25		10 Amp Red	Power Mirror/T-Case Brake
26		20 Amp Yellow	Brake Switch/Center High Mount Stop Light (CHMSL)/ Aftermarket CHMSL
27	40 Amp Green		Power Seats
28		10 Amp Red	Power Run/Start-PCM/Steering Angle Sensor
29		10 Amp Red	4X4 Switch/Pass Dr Switch/EC Mirror
30		15 Amp Blue	Power Run/Start-ABS/RWAL/Smart Bar/YAW Sensor/ Universal Exhaust Gas Oxygen (Uego) Sensor Controller
31		10 Amp Red	TCM (Diesel)
32		10 Amp Red	Power Ignition Run — Adjustable Pedals LED

Cavity	Cartridge Fuse	Mini Fuse	Description
33		10 Amp Red	Power-IGN Run — HVAC
34		—	—
35		15 Amp Blue	Cabin Compartment Node (CCN) Illumination
36		25 Amp Natural	Audio_Amplifier
37		15 Amp Blue	Variable Gate Turbo (VGT) — Turbo Diesel

Cavity	Cartridge Fuse	Mini Fuse	Description
38		20 Amp Yellow	Power Outlet IP
39		10 Amp Red	Seatbelt Tension Reducer/Power IGN Run/Acc
40		20 Amp Yellow	Power IGN Run/Acc — Cigar Lighter/Rear Power Point
41		—	—
42	30 Amp Pink		Diesel PCM

CAUTION!

- **When installing the Integrated Power Module cover, it is important to ensure the cover is properly positioned and fully latched. Failure to do so may allow water to get into the Integrated Power Module, and possibly result in a electrical system failure.**
- **When replacing a blown fuse, it is important to use only a fuse having the correct amperage rating. The use of a fuse with a rating other than indicated may result in a dangerous electrical system overload. If a properly rated fuse continues to blow, it indicates a problem in the circuit that must be corrected.**

VEHICLE STORAGE

If you are storing your vehicle for more than 21 days, we recommend that you take the following steps to minimize the drain on your vehicle's battery:

- Disconnect the Ignition-Off Draw fuse (IOD) fuse located in the Integrated Power Module, located in the engine compartment. The IOD cavity includes a snap-in retainer that allows the fuse to be disconnected, without removing it from the fuse block.
- The electronic shift transfer case should be placed in the 4HI mode and kept in this position to minimize the battery drain.
- As an alternative to the above steps you may disconnect the negative cables from both batteries.

- Any time you store your vehicle, or keep it out of service (i.e., vacation) for two weeks or more, run the air conditioning system at idle for about five minutes in the fresh air and high blower setting. This will ensure adequate system lubrication to minimize the possibility of compressor damage when the system is started again.

NOTE: When reinstalling the IOD fuse push firmly until fully seated; the gauges in the instrument cluster will do a full sweep when the ignition key is cycled to RUN. This is a normal condition.

NOTE: When the vehicle is shipped from the factory, the IOD fuse is in the up, or extracted position. If the radio, interior lamps, keyless entry, or other features do not work with the key OFF, check the position of the fuse (or check to see if the fuse is blown) to ensure that it is fully seated. When the IOD fuse is extracted, the instrument cluster in the odometer window will display "NO FUSE."

REPLACEMENT LIGHT BULBS

LIGHT BULBS — Inside	Bulb No.
Overhead Console Lights	TS 212-2
Dome Light	7679

NOTE: For lighted switches, see your authorized dealer for replacement instructions.

All of the inside bulbs are brass or glass-wedge base. Aluminum base bulbs are not approved.

LIGHT BULBS — Exterior	Bulb No.
Backup	1156
Fog Light	9006LL
Headlight (Halogen)	H13
Side Marker, Park & Turn Signal	1157
Rear License Plate Lamp	1157
Rear Cargo Light	912
Tail & Stop	1157

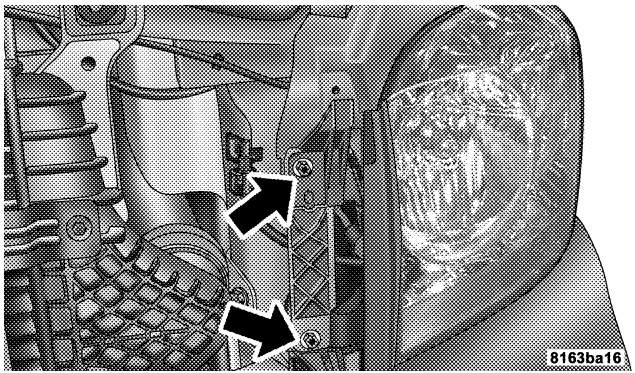
BULB REPLACEMENT

Headlight (Halogen)/Front Park and Turn Lights

CAUTION!
This is a halogen bulb. Avoid touching the glass with your fingers. Reduced bulb life will result.

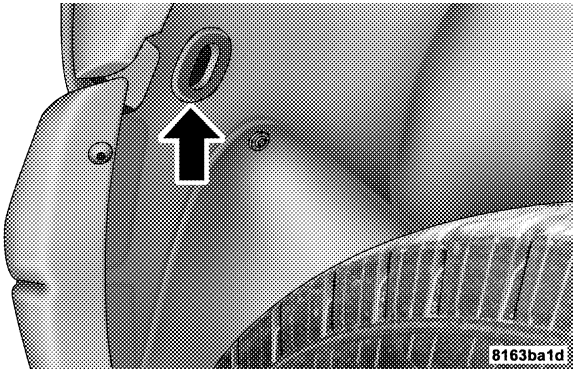
1. Open the hood.

2. Remove the two bolts from the front of the headlight housing.

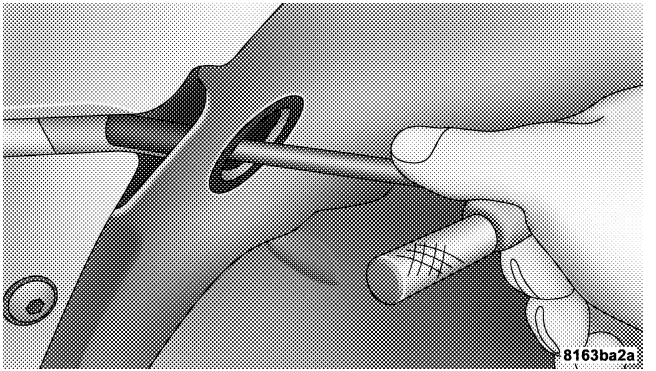


Front Headlight Housing Bolts

3. Remove the plug from the inner fender well and remove the nut through the access hole.



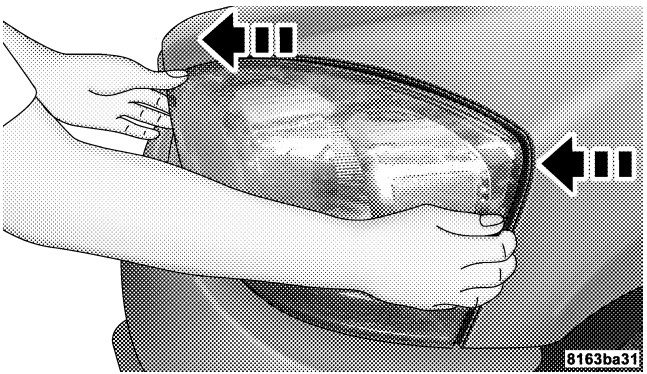
Inner Fender Plug



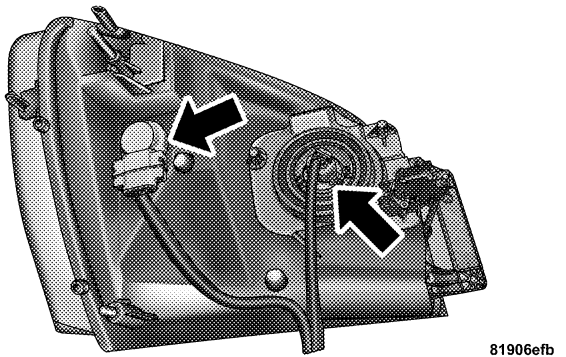
Rear Headlight Housing Nut Access

4. Pull the housing out from the fender to allow room to disconnect the electrical connectors.

NOTE: For easier removal, pull the headlight assembly straight forward, applying the greatest amount of force to the outer edge of the headlight assembly.



Headlight Removal



Bulb Removal

5. Unlock and pull connector straight from the base of the headlight halogen bulb.

6. Twist connector on the side marker/turn signal/park light bulb ¼ turn and remove connector and bulb from housing.

7. Remove housing from vehicle with headlight halogen bulb in housing.

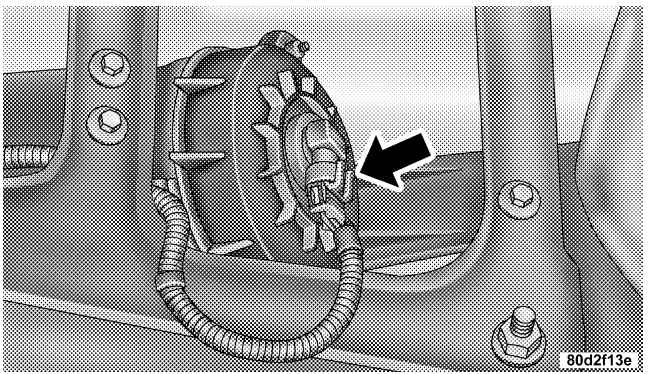
8. Twist the headlight halogen bulb ¼ turn and remove headlight bulb from the housing.

9. Replace headlight or side marker/turn signal/park light bulb. Do not touch the headlight halogen bulb.

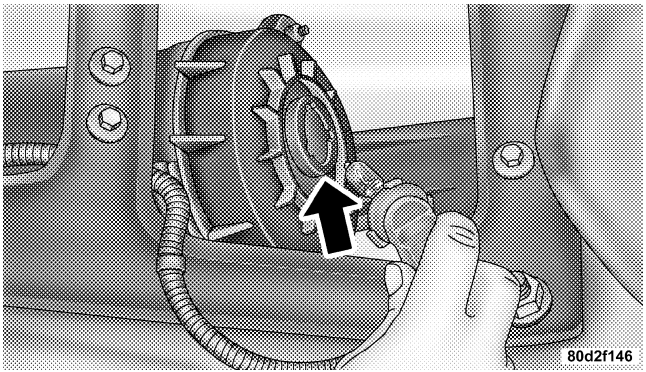
10. Reverse procedure for installation of bulbs and housing.

Fog Lights

1. Reach under the vehicle, unlock and twist connector counterclockwise ¼ turn and remove connector and bulb from housing.



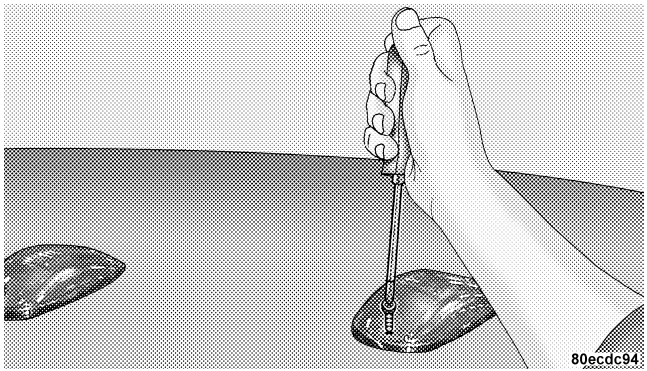
2. Pull bulb straight from the connector.



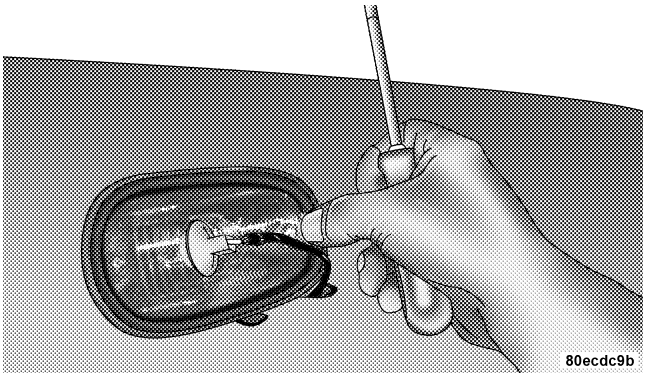
3. Reverse procedure for installation of bulbs and housing.

Cab Top Clearance Lights — If Equipped

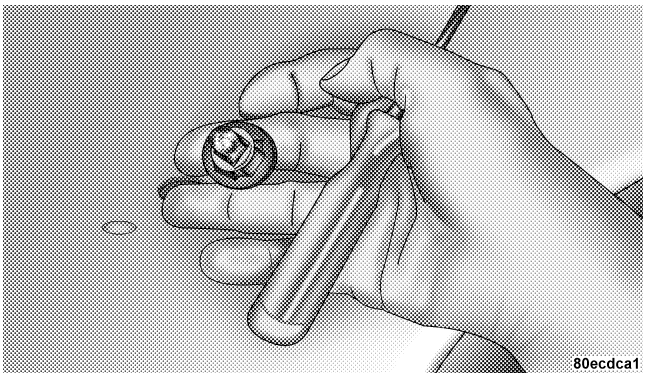
1. Remove the two screws from the top of the light.



2. Rotate the socket ¼ turn and pull it from the light assembly.



3. Pull the bulb straight from its socket and replace.



FLUID AND CAPACITIES

	U.S.	Metric
Fuel (Appoximate)		
6.7L HO Turbo Diesel Engine		
Standard Rear Tank	52 gal	197 L
Optional Midship Tank	22 gal	83 L

	U.S.	Metric
Engine Oil (with filter)		
6.7L HO Turbo Diesel Engine (SAE 15W-40, API CJ-4 Certified, that meets CES 20081 Standards.)	12 qts	11.4 L
Cooling System		
6.7L Diesel Engine I-6	22.6 qts	21.4 L

FLUIDS, LUBRICANTS AND GENUINE PARTS

Engine

Component	Fluids, Lubricants and Genuine Parts
Engine Coolant	Antifreeze/Coolant 5– Year/100,000–Mile Formula HOAT (Hybrid Organic Additive Technology).
6.7L Turbo Diesel Engine Oil	Use (SAE 15W-40, API CJ-4 Certified). Products meeting Cummins® CES 20081 Standards may be used.
Engine Oil Filter **(6.7L Diesel Engine)**	Engine Oil Filter, P/N MSL 05083285AA or equivalent.
Engine Fuel Filter **(6.7L Diesel Engine)**	Fuel Filter, P/N MSL 05183410AA or equivalent. Must meet seven micron rating. **Using a fuel filter that does not meet the manufacturers filtration and water separating requirements can severely impact fuel system life and reliability.**
Crankcase Ventilation Filter **(6.7L Diesel Engine)**	CCV Filter, P/N MSL 68001433AA or equivalent.

Component	Fluids, Lubricants and Genuine Parts
Fuel Selection **(6.7L Turbo Diesel Engine)**	Use good quality diesel fuel from a reputable supplier in your vehicle. Federal law requires that you must fuel this vehicle with Ultra Low Sulfur Highway Diesel fuel (15 ppm Sulfur maximum) and prohibits the use of Low Sulfur Highway Diesel fuel (500 ppm Sulfur maximum) to avoid damage to the emissions control system. For most year-round service, No. 2 diesel fuel meeting ASTM specification D-975 Grade S15 will provide good performance. If the vehicle is exposed to extreme cold (below 20°F or -7°C), or is required to operate at colder-than-normal conditions for prolonged periods, use climatized No. 2 diesel fuel or dilute the No. 2 diesel fuel with 50% No. 1 diesel fuel. This will provide better protection from fuel gelling or wax-plugging of the fuel filters. **This vehicle is fully compatible with biodiesel blends up to 5% biodiesel meeting ASTM specification D-975.**

Chassis

Component	Fluids, Lubricants and Genuine Parts
Automatic Transmission (6-Speed AS68RC)	Mobil® ATF 3309 or Mopar AS68RC ATF.
Transfer Case	ATF+4, Automatic Transmission Fluid.
Manual Transmission Fluid G-56	ATF+4, Automatic Transmission Fluid.
Clutch Linkage	Multipurpose Grease, NLGI Grade 2 E.P. or equivalent.
Front and Rear Axle Fluid (4500/ 5500)	GL-5 SAE 75W-90 Synthetic or equivalent.
Brake Master Cylinder	DOT 3 and SAE J1703 should be used or equivalent. If DOT 3 brake fluid is not available, then DOT 4 is acceptable. Use only recommended brake fluids.
Power Steering Reservoir	ATF+4, Automatic Transmission Fluid.

MAINTENANCE SCHEDULES

CONTENTS

■ Emission Control System Maintenance 448

■ Maintenance Schedules — 6.7L Turbo Diesel 448

□ Oil Change Indicator System 450

□ Maintenance Schedule 451

EMISSION CONTROL SYSTEM MAINTENANCE

The Scheduled maintenance services, listed in **bold type** in this section (Section 8) must be done at the times or mileages specified to assure the continued proper functioning of the emission control system. These, and all other maintenance services included in this manual, should be done to provide best vehicle performance and reliability. More frequent maintenance may be needed for vehicles in severe operating conditions, such as dusty areas and very short trip driving.

Inspection and service also should be done anytime a malfunction is suspected.

NOTE: Maintenance, replacement, or repair of the emission control devices and systems on your vehicle may be performed by any automotive repair establishment or individual using any automotive part which has been certified pursuant to U.S. EPA or, in the State of California, California Air Resources Board regulations.

MAINTENANCE SCHEDULES — 6.7L TURBO DIESEL

CAUTION!

Failure to perform the required maintenance items may result in damage to the vehicle.

At Each Stop for Fuel

- Check the engine oil level about 30 minutes after a fully warmed engine is shut off. Checking the oil level while the vehicle is on level ground will improve the accuracy of the oil level reading. Add oil only when the level is at or below the ADD or MIN mark.
- Check the windshield washer solvent and add if required. When refilling the washer fluid reservoir, take some washer fluid and apply it to a cloth or towel and wipe clean the wiper blades; this will help blade performance.

Once a Month

- Check tire pressure and look for unusual wear or damage.
- Inspect the batteries and clean and tighten the terminals as required.
- Check the fluid levels of coolant reservoir, transmission and transfer case (if equipped), add as needed.
- Check master cylinder reservoir fluid level for indications of brake maintenance.
- **Check Filter Minder™ (If Equipped). Replace air cleaner filter element if necessary.**
- Check all lights and all other electrical items for correct operation.

At Each Oil Change

- Change the engine oil filter.
- Inspect the exhaust system.
- Inspect the brake hoses.
- Inspect the U-Joints (if equipped) and front suspension components.
- Check the automatic transmission fluid level.
- Check the manual transmission fluid level.
- Check the coolant level, hoses, and clamps.
- Lubricate outer tie rod ends (4X4) models only.
- Lubricate front drive shaft fitting (4X4).

Inspection and service should also be performed anytime a malfunction is observed or suspected. Retain all receipts.

Oil Change Indicator System

Your vehicle is equipped with an engine oil change indicator system. This system will alert you when it is time to change your engine oil by displaying the words "Oil Change Required" on your Electronic Vehicle Information Center (EVIC). The engine oil change indicator system is duty cycle based, which means the engine oil change interval may fluctuate depending on your personal driving style. Driving styles, such as frequent stop-and-go type driving can increase the frequency of the engine oil change. This is the result of more frequent regeneration of the exhaust aftertreatment system, which can decrease the life of the engine oil. Failure to change the engine oil per the maintenance schedule can result in internal engine damage.

For information on resetting the oil change indicator message, refer to "Oil Change Required – If Equipped," under "System Status (EVIC Displays)" in the "Electronic Vehicle Information Center (EVIC)" in Section 3.

Maintenance Schedule

Miles (Kilometers) [Months]	7,500 (12 000) [6]	15,000 (24 000) [12]	22,500 (36 000) [18]	30,000 (48 000) [24]	37,500 (60 000) [30]
Change engine oil and engine oil filter.	X	X	X	X	X
Lubricate front drive shaft fitting (4X4).	X	X	X	X	X
Rotate tires.	X	X	X	X	X
Lubricate outer tie rod ends.	X	X	X	X	X
Check transfer case fluid level (4X4).				X	
Change front axle fluid (4500/5500 4X4).		X		X	
Change automatic transmission fluid.				X	
Replace fuel filter element.		X		X	
Inspect the brake linings, replace if necessary.			X		
Inspect and adjust parking brake if necessary.			X		
Inspect front wheel bearings.				X	
Inspect drive belt, replace as necessary.			X		

Miles (Kilometers) [Months]	45,000 (72 000) [36]	52,500 (84 000) [42]	60,000 (97 000) [48]	67,500 (109 000) [54]	75,000 (121 000) [60]
Change engine oil and engine oil filter.	X	X	X	X	X
Lubricate front drive shaft fitting (4X4).	X	X	X	X	X
Rotate tires.	X	X	X	X	X
Lubricate outer tie rod ends.	X	X	X	X	X
Change transfer case fluid (4X4).			X		
Change front axle fluid (4500/5500 4X4).	X		X		X
Change rear axle fluid (4500/5500 4X4 and 4X2).			X		
Change automatic transmission fluid.			X		
Change manual transmission fluid.			X		
Flush and replace engine coolant at 60 months, if not replaced at 100,000 miles (160 000 km).					X
Inspect drive belt, replace as necessary.	X				X
Replace fuel filter element.	X		X		X
Inspect the brake linings, replace if necessary.	X			X	

Miles **(Kilometers)** **[Months]**	**45,000** **(72 000)** **[36]**	**52,500** **(84 000)** **[42]**	**60,000** **(97 000)** **[48]**	**67,500** **(109 000)** **[54]**	**75,000** **(121 000)** **[60]**
Inspect and adjust parking brake if necessary.	X			X	
Inspect front wheel bearings.			X		
Replace Crankcase Ventilation Filter (CCV).					X

Miles (Kilometers) [Months]	82,500 (133 000) [66]	90,000 (145 000) [72]	97,500 (157 000) [78]	100,000 (160 000)	105,000 (169 000) [84]
Change engine oil and engine oil filter.	X	X	X		X
Lubricate front drive shaft fitting (4X4).	X	X	X		X
Rotate tires.	X	X	X		X
Lubricate outer tie rod ends.	X	X	X		X
Flush and replace engine coolant, if not replaced at 60 mos.				X	
Check transfer case fluid level (4X4).		X			
Change front axle fluid (4500/5500 4X4).		X			X
Change automatic transmission fluid.		X			
Inspect drive belt, replace as required.*		X			X
Replace fuel filter element.		X			X
Inspect front wheel bearings.		X			
Inspect the brake linings, replace if necessary.		X			X
Inspect and adjust parking brake if necessary.		X			X

Miles (Kilometers) [Months]	**112,500 (181 000) [90]**	**120,000 (193 000) [96]**	**127,500 (205 000) [102]**	**135,000 (217 000) [108]**	**142,500 (229 000) [114]**	**150,000 (241 000) [120]**
Change engine oil and engine oil filter.	X	X	X	X	X	X
Lubricate front drive shaft fitting (4X4).	X	X	X	X	X	X
Rotate tires.	X	X	X	X	X	X
Lubricate outer tie rod ends.	X	X	X	X	X	X
Flush and replace engine coolant at 120 months, if not replaced at 100,000 miles (161 000 km).						X
Inspect drive belt, replace as required.*		X		X		X
Change transfer case fluid (4X4).		X				
Check transfer case fluid level (4X4).						X
Change front axle fluid (4500/5500 4X4).		X		X		X
Change rear axle fluid (4500/5500 4X4 and 4X2).		X				
Change automatic transmission fluid.		X				X
Change manual transmission fluid.		X				

Miles (Kilometers) [Months]	112,500 (181 000) [90]	120,000 (193 000) [96]	127,500 (205 000) [102]	135,000 (217 000) [108]	142,500 (229 000) [114]	150,000 (241 000) [120]
Replace fuel filter element.		X		X		X
Inspect front wheel bearings.		X			X	
Inspect the brake linings, replace if necessary.	X			X		
Inspect and adjust parking brake if necessary.	X			X		
Adjust valve lash clearance.						X
Replace Crankcase Ventilation Filter (CCV).						X

Inspection and service should also be performed any time a malfunction is observed or suspected. Retain all receipts.

*This maintenance is not required if belt was previously replaced.

WARNING!

You can be badly injured working on or around a motor vehicle. Do only that service work for which you have the knowledge and the right equipment. If you have any doubt about your ability to perform a service job, take your vehicle to a competent mechanic.

IF YOU NEED CONSUMER ASSISTANCE

CONTENTS

- Suggestions For Obtaining Service For Your Vehicle 458
  - Prepare For The Appointment 458
  - Prepare A List 458
  - Be Reasonable With Requests 458
- If You Need Assistance 458
  - Sterling Customer Assistance Center 459
- Warranty Information 459
- Reporting Safety Defects 460
- Department Of Transportation Uniform Tire Quality Grades 460
  - Treadwear 461
  - Traction Grades 461
  - Temperature Grades 461

SUGGESTIONS FOR OBTAINING SERVICE FOR YOUR VEHICLE

Prepare For The Appointment

If you're having warranty work done, be sure to have the right papers with you. Take your warranty folder. All work to be performed may not be covered by the warranty. Discuss additional charges with the service manager. Keep a maintenance log of your vehicle's service history. This can often provide a clue to the current problem.

Prepare A List

Make a written list of your vehicle's problems or the specific work you want done. If you've had an accident or work done that is not on your maintenance log, let the service advisor know.

Be Reasonable With Requests

If you list a number of items and you must have your vehicle by the end of the day, discuss the situation with the service advisor and list the items in order of priority. At many authorized dealers, you may obtain a rental vehicle at a minimal daily charge. If you need a rental, it is advisable to make these arrangements when you call for an appointment.

IF YOU NEED ASSISTANCE

The manufacturer and its authorized dealers are vitally interested in your satisfaction. We want you to be happy with our products and services.

Warranty service must be done by an authorized dealer. We strongly recommend that you take your vehicle to your authorized selling dealer. They know you and your vehicle best, and are most concerned that you get prompt and high quality service. The manufacturer's authorized dealers have the facilities, factory-trained technicians,

special tools, and the latest information to ensure your vehicle is fixed correctly and in a timely manner.

This is why you should always talk to your authorized dealer's service manager first. Most matters can be resolved with this process.

- If for some reason you are still not satisfied, talk to the general manager or owner of the authorized dealership. They want to know if you need assistance.
- If your authorized dealership is unable to resolve the concern, you may contact the Customer Assistance Center.

Any communication to the Customer Assistance Center should include the following information:

- Owner's name and address
- Owner's telephone number (home and office)
- Authorized dealership name
- Vehicle Identification Number (VIN)
- Vehicle delivery date and mileage

Sterling Customer Assistance Center

Call the Customer Assistance Center at 1-800-785-4357 or 1-800-STL-HELP. Call night or day, weekdays or weekends, for dealer referral, vehicle information, breakdown coordination, or Fleetpack assistance. Our people are knowledgeable, professional, and committed to following through to help you keep your truck moving.

WARRANTY INFORMATION

See the Owner's Warranty Information Booklet for the terms and provisions of warranties applicable to this vehicle.

REPORTING SAFETY DEFECTS

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Sterling Truck Corporation.

If the NHTSA receives similar complaints, it may open an investigation and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Sterling Truck Corporation.

To contact NHTSA, you may call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to www.safercar.gov; or write to: Administrator, NHTSA, 400 Seventh Street, SW, Washington, DC 20590. You can also obtain other information about motor vehicle safety from www.safercar.gov.

Canadian customers who wish to report a safetyrelated defect to Transport Canada, Defect Investigations and Recalls, may telephone the tollfree hotline 1-800-333-0510, or contact Transport Canada by mail at: Transport Canada, ASFAD, Place de Ville Tower C, 330 Sparks Street, Ottawa, Ontario, Canada K1A 0N5.

For additional road safety information, please visit the Road Safety website at: www.tc.gc.ca/roadsafety/menu.htm.

DEPARTMENT OF TRANSPORTATION UNIFORM TIRE QUALITY GRADES

The following tire grading categories were established by the National Highway Traffic Safety Administration. The specific grade rating assigned by the tire's manufacturer in each category is shown on the sidewall of the tires on your vehicle.

All passenger car tires must conform to Federal safety requirements in addition to these grades.

Treadwear

The treadwear grade is a comparative rating, based on the wear rate of the tire when tested under controlled conditions on a specified government test course. For example, a tire graded 150 would wear 1-1/2 times as well on the government course as a tire graded 100. The relative performance of tires depends upon the actual conditions of their use, however, and may depart significantly from the norm due to variations in driving habits, service practices, and differences in road characteristics and climate.

Traction Grades

The traction grades, from highest to lowest, are AA, A, B, and C. These grades represent the tire's ability to stop on wet pavement, as measured under controlled conditions on specified government test surfaces of asphalt and concrete. A tire marked C may have poor traction performance.

WARNING!

The traction grade assigned to this tire is based on straight-ahead braking traction tests, and does not include acceleration, cornering, hydroplaning, or peak traction characteristics.

Temperature Grades

The temperature grades are A (the highest), B, and C, representing the tire's resistance to the generation of heat and its ability to dissipate heat, when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the material of the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure. The grade C corresponds to a level of performance, which all passenger car tires must meet under the Federal Motor

Vehicle Safety Standard No. 109. Grades B and A represent higher levels of performance on the laboratory test wheel, than the minimum required by law.

WARNING!

The temperature grade for this tire is established for a tire that is properly inflated and not overloaded. Excessive speed, under-inflation, or excessive loading, either separately or in combination, can cause heat buildup and possible tire failure.

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APPENDIX

NAVIGATION USER'S MANUAL

USER AGREEMENT

If you have any questions about the operation of the navigation system, please contact Alpine Customer Service at 1-866-733-5492.

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SAFETY GUIDELINES

Ensure that all persons read this manual carefully before using the navigation system. It contains instructions on how to use the system in a safe and effective manner.

Warning: *Please read and follow these safety precautions. Failure to do so may result in injury or property damage.*

- Do not operate the product while driving. Always stop the vehicle in a safe location before using the system.
- When using the navigation system to route you to an emergency facility, contact the facility to verify its location.
- Not all emergency service locations are contained in the database. Please use your own judgment and ask for directions in such situations.
- Glance at the screen only when necessary and safe to do so. If prolonged viewing of the screen is necessary, pull over at a safe location.
- Road conditions and regulations take precedence over information contained on the map display. Observe actual traffic restrictions and circumstances while driving.
- Stop use immediately if a problem occurs. Failure to do so may cause injury or damage to the product. Return it to your authorized Sterling dealer for repair.
- There may be situations where the navigation system erroneously displays the vehicle's location. Use your own driving judgment in this situation, taking into account current driving conditions. Please be aware that in this situation the navigation system should automatically correct the vehicle's position within a few minutes.
- Make certain that the volume level of the system is set to a level that still allows you to hear outside traffic and emergency vehicles.
- The map database is designed to provide you with route suggestions and does not take into account the relative safety of a suggested route or of factors that may affect the time required to reach your destination. The system

does not reflect road closures or construction, road characteristics (i.e. type of road surface, slope or grade, weight or height restrictions, etc.), traffic congestion, weather conditions, or any other factors that may affect the safety or timing of your driving experience. Use your own personal judgment if the navigation system is unable to provide you with an alternate route.

NAVIGATION SYSTEM CARE & USE

Cleaning the LCD Display

- Blow on the LCD display to remove dust. If that does not remove the dust, use a clean, dry lens cloth to clean the LCD display. Wipe the display carefully to prevent scratches.
- To remove a fingerprint from the display, carefully press a piece of Scotch® tape (adhesive side down) on the print and slowly remove.
- Do not use any type of cleaning solvent on the display.

Cleaning the Faceplate

- Spray a clean cloth with a small amount of gentle cleaning solvent and wipe over the faceplate.

CD/DVD Player Care

- Always check the CD or DVD player for discs before inserting another disc. Failure to do so may cause damage to the system.
- Take care when removing a disc from the CD or DVD player. The disc might be hot.
- Do not place fingers or foreign objects into the CD/DVD-ROM insertion slot. Doing so may result in injury or damage to the product.

Warning: *Do not use a disc cleaning device in the CD or DVD player.*

Welcome to your new Navigation System. The information in this Owner's Manual is designed to help you begin using your system quickly and safely. It contains the following information to help you become familiar with the system:

- Safety guidelines
- System features
- System limitations
- Detailed descriptions of system menus and controls

Before using the system, please take some time to familiarize yourself with the information included in this manual.

System Overview

Your navigation system receives GPS signals from up to 8 satellites to display the position of your vehicle. Map and database information is supplied through a DVD-ROM. A gyroscope and the vehicle's speed sensor enable the system to display the present vehicle position even in locations where GPS signals may be blocked.

When you input a destination, the navigation system uses map data from the DVD-ROM to quickly calculate a route. As you drive along your chosen route, you are guided with pictorial displays and voice prompts.

About the DVD-ROM

The DVD-ROM disc that is included with your system provides coverage for the contiguous United States and parts of Canada. Please note that this DVD-ROM is the only DVD that will operate in your system. Database discs from other navigation systems or other types of DVDs (music, movie, etc.) are not compatible and will not run.

System Features

Multiple Mode Destination Selection

Destinations can be selected from these 10 categories:

- a point of interest (POI)
- an address
- your personal address book
- a recent destination
- the Home designation

- a special feature called Trip Itinerary
- a city center
- a location selected directly from the map display
- a phone number
- an intersection

Next Maneuver Guidance
When an upcoming turn is approaching, the system will give maneuver instructions via arrow guides and simple voice prompts.

Map Zoom
The map display has 9 different zoom scales to allow you to increase or decrease map magnification.

Recent Route
Up to 11 previous destinations can be stored in the Recent Route list.

GPS Clock
The clock will automatically adjust according to GPS time. This time is also displayed directly on the screen.

Trails
You can display a "bread crumb" trail that appears on the **Map** screen as you drive. This feature helps to log where you have traveled and is also useful for "off-roading".

Different Languages
The navigation system can guide you in 3 different languages: English, Spanish, and French. The text and guidance are in your language of choice.

Address Book
Up to 100 personal locations and phone numbers can be stored in the system's memory. Up to 7 custom Address Book folders can be created.

Points of Interest (POI)
You can select a destination from a list of popular places and locations, or point of interest (POI). The navigation system's database contains thousands of POIs in many different categories, such as ATMs, Banks, Gas/Fuel Stations, and Restaurants. Up to 8 different POI icons can be programmed to appear on the map.

Routing Options
You can program the system to minimize the use of toll roads, maximize freeways, or to provide the quickest or shortest route. If you go off course at any time, the system can automatically recalculate a route to the destination from your present location.

Emergency Information Locator
This option allows you to locate the police stations, fire departments, hospitals and medical centers, nearest to your current vehicle position.

Personal Menu

If you have a favorite destination or POI category you can store it in the Personal Menu. The Personal Menu holds up to 5 addresses, intersections, POIs, or POI categories.

Vehicle Information
This option allows you to schedule vehicle maintenance reminders, view trip information, and view the number of satellites being read by the system.

A Note About Coverage

Your navigation system contains a Full Coverage database. This database includes all roads in the US and is comprised of 2 kinds of data: Detailed Coverage Data and Unverified Coverage Data:

Detailed Coverage Data - The most detailed level of coverage available. Provides for door-to-door, turn-by-turn route guidance in major metropolitan areas. Contains every named road, all addresses, thousands of points of interest (POI), and significant cartographic features. Every legal road in the detailed area has been verified and contains up to 150 attributes to describe the characteristics of that road, such as turn restrictions, one-way streets, dividers, vehicle restrictions, etc.

Unverified Coverage Data – Roads that are included in the full coverage database but have not been verified (approximately 5% of the US roads in the database). Provides for destination selection and point-to-point guidance anywhere in the US. Voice guidance and turn-by-turn route guidance are not available in these areas. (See “Route Guidance in an Unverified Area” for details.)

System Limitations

The DVD-ROM that is included with your system contains the most recent map data available at the time of production. Because of changes in streets, neighborhoods, and business locations, there may be situations where the navigation system is not able to route you to your desired destination by the entry method you have chosen. If this occurs, choose another entry method.

For example, if the system doesn't recognize the street address you are searching for, try to find your destination by inputting the closest cross street names (see "Street Intersection" for details).

Software upgrades are available to keep your system current. To obtain information about upgraded map data, please call Alpine Customer Service at 1-866-733-5492 (Monday through Friday, 9 am to 5 pm Eastern Standard Time).

Vehicle Position

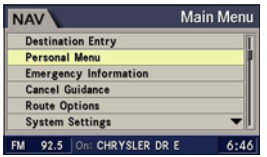
While the system uses multiple inputs to determine vehicle position, there are factors that may cause the position to be displayed incorrectly:

- Weak GPS reception caused by the obstruction of satellite signals (tall buildings, tunnels, indoor parking lots).
- Road mismatch. If there is an adjacent road within approximately 35-100 feet (10-30 meters) of your current position, the system may display your vehicle on the adjacent road.
- Non-use of navigation disc for several days. If the navigation disc is removed from the navigation system and reinserted at a later date, the navigation system may temporarily display an incorrect vehicle position.

Driving the vehicle in an area of good GPS reception should correct these errors so that the vehicle position is correctly displayed. (Please note, it may take several minutes for the system to correct the vehicle position.)

Main Menu Screen

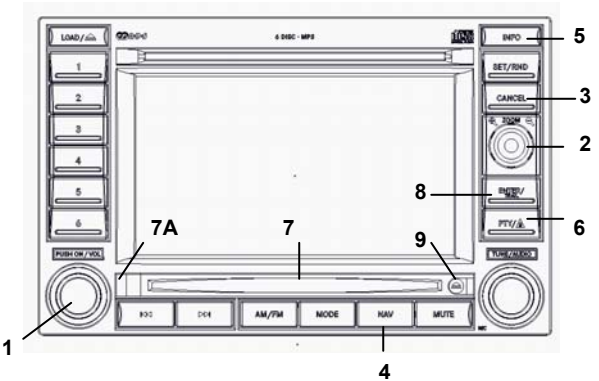
Navigation operation begins at the **Main Menu** screen. To access the **Main Menu** screen from anywhere in the system, press the NAV button.



- Select “Destination Entry” when you want to program a destination. You can input a destination in one of 10 ways. (See “Selecting a Destination” for details.)
- Select “Personal Menu” to access a favorite destination or POI category. (See “Personal Menu” for details.)
- Select “Emergency Information” to access the locations of the police stations, fire departments, hospital and medical centers, nearest to your current location. (See "Emergency Information” for details.)
- Select “Cancel Guidance” to cancel route guidance. (See “Canceling Route Guidance” for details.)
- Select “Route Options” to edit the properties of a programmed route. This screen is available only when a destination is programmed into the unit. It allows you to display a turn-by-turn listing of your route and create a detour. You can customize the route by telling the system to use the quickest or shortest route, travel by freeway, or minimize toll road travel. (See “Routing Options” for details.)
- Select “System Settings” when you want to adjust the settings of the navigation system. (See “System Settings” for details.)
- Select “Vehicle Information” to schedule a vehicle maintenance reminder, view trip information, view the number of satellites the system is receiving, and view software information. (See “Vehicle Information” for details.)

Controls and Pushbuttons

There are several controls that you will frequently use when using the navigation system:



The Push On/Vol knob (1) is used to turn the navigation radio on and off and to adjust the volume of the navigation voice command.

The Select Encoder (2) and ENTER button (8) work together to input route information. The Select Encoder is an 8-way joystick that allows you to scroll through navigation menus and map icons. The ENTER button is used to input highlighted information into the system.

The CANCEL button (3) is similar to the back button on a computer. When pressed, CANCEL will return you to the previous screen. Pressing CANCEL after a route has been calculated will cancel the route.

The NAV button (4) allows you to access the **Main Menu** screen from anywhere in the navigation system.

Push the INFO button (5) to repeat voice guidance during route guidance.

Push the PTY button (6) when you're at the **Map** screen to change vehicle orientation.

The DVD slot, where the navigation DVD is inserted and housed, is located behind the DVD slot cover (7). The DVD slot cover tab (7A) allows access to the DVD. The EJECT button (9) is also located behind the DVD slot cover.

How to Install or Eject the Navigation DVD

1. Press the DVD slot cover tab (7A) with a sharp non-metallic tool, such as a toothpick.
2. Gently pull to remove the DVD slot cover (7). The DVD slot is behind the DVD slot cover.
3. To eject the DVD, use a sharp non-metallic tool to press the EJECT button (9) to the right of the slot. Carefully remove the disc.
4. To insert the DVD, place the disc in the slot until the unit accepts the disc.
5. Be sure to replace the DVD slot cover after ejecting/inserting the Navigation DVD. Insert the right end of the DVD slot cover into the opening to the right of the eject button first. Press the left end of the DVD slot cover until it snaps into place.

Software Initialization

Before you use your navigation system for the first time or when installing software updates, the system software will need to be written to the system.

1. Turn the ignition key to the ON position. The opening screen should appear on the monitor display.
2. If installing a software update, remove the old version of the map disc from the DVD player (see "How to Install or Eject the Navigation DVD").
3. Insert the new DVD-ROM map disc into the DVD player. The system will automatically begin downloading the software.

NOTE: Do not turn off the vehicle's engine or operate the navigation system during program writing.

4. The opening screen appears when the download is complete.
5. Drive the vehicle several miles in an area with an open view to the sky. This will correctly synchronize the navigation system.

NOTE: When powering on the unit for the first time, it takes the GPS receiver approximately 10 minutes to calculate the vehicle's current position. During this period, the vehicle position icon may not move even if the vehicle is being driven.

Inputting Information

Keyboard Features

NAV
Input Street Name
P_
In:MI
2212
A B C D E F G H I J K L
M N O P Q R S T U V W X
Y Z 1 2 3 4 5 6 7 8 9 0
- & ' / SPACE
DELETE
STREET LIST
FM 92.5 On: CHRYSLER DR E 7:08
1
2
3

1. Space —Creates a space between characters.
2. List function (available only when inputting street or intersection name, POI place name, or destination by phone number)—Displays a list of the names or numbers for the selected characters. You can search for a name or phone number by inputting the first few characters and selecting "List". A list of the closest matching selections will appear.
3. Delete—Deletes characters entered in the text window.

Input Process

To input a name or number into the system, use the Select Encoder to highlight the first character of the name/number and press ENTER. The character will appear in the text window. The system will display only the character matches for the next entry. All unnecessary characters are grayed. Select from the characters remaining and press ENTER. Repeat this process until the entry is complete.

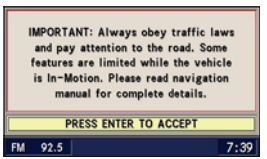
Helpful Hints

- Make sure you input the exact name into the system. If the name is spelled wrong or is missing characters (i.e. apostrophe, dash, space), the system may route you to the wrong location.
- For best results when inputting a highway, enter the highway number exactly as it appears on the highway sign. For example, Interstate 75 should be input as I-75, **not** I75. You do not have to input a N, S, E, or W designation. A list of all possible highways will be displayed after you select "Street List".

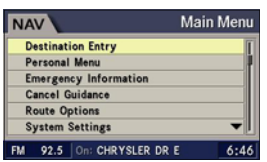
Navigation at a Glance

The following example briefly describes how to use the navigation system. In this example you will learn how to find a destination using a known street address in a verified area.

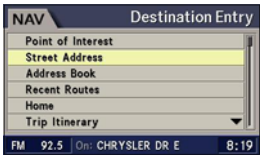
1. Turn the unit on by pressing the PUSH ON/VOL button. Press the NAV button to activate the navigation system. The opening screen appears followed by a disclaimer screen. Press ENTER to accept this statement.


IMPORTANT: Always obey traffic laws and pay attention to the road. Some features are limited while the vehicle is In-Motion. Please read navigation manual for complete details.
PRESS ENTER TO ACCEPT
FM 92.5
7:39

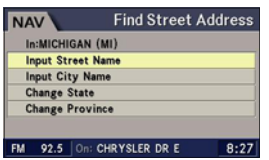
2. The **Main Menu** screen appears. Use the Select Encoder to highlight the desired option. In this example we will be searching for an address by destination, so highlight "Destination Entry". Press ENTER to continue.



3. The **Destination Entry** screen appears. At this screen you can search for your destination in several ways. In this example we are searching by street address, so highlight "Street Address". Press ENTER .



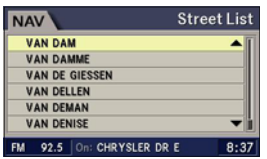
4. The **Find Street Address** screen appears. There are 4 options to choose from: Street Name, City Name, Change State, and Change Province. Highlight "Input Street Name" and press ENTER.



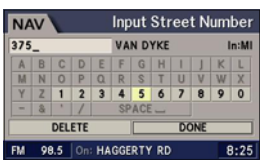
5. The **Input Street Name** screen appears. Use the Select Encoder to spell out the desired street name. Highlight the first

NAV
Input Street Name
VAN_
In:MI
191
A B C D E F G H I J K L
M N O P Q R S T U V W X
Y Z 1 2 3 4 5 6 7 8 9 0
- & ' / SPACE _
DELETE
STREET LIST
FM 92.5 On: CHRYSLER DR E
7:08

letter of the street name and press ENTER. Highlight the second letter and press ENTER. Continue this process until the name is spelled out. Highlight "Street List" and press ENTER to continue.



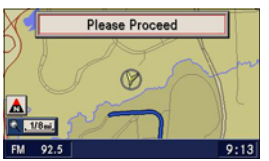
6. The **Street List** screen appears. Select a street name and press ENTER.


NAV
Input Street Number
375_
VAN DYKE
In:MI
A B C D E F G H I J K L
M N O P Q R S T U V W X
Y Z 1 2 3 4 5 6 7 8 9 0
- & ' / SPACE
DELETE
DONE
FM 98.5 On: HAGGERTY RD 8:25

7. The **Input Street Number** screen appears if there is a number associated with the address. Use the Select Encoder to input the address number. Use the same procedure that you used for inputting the street name in Step 5. When you are finished, highlight "Done" and press ENTER.

NOTE: If the chosen address is in more than one city, the **City List** screen will appear. If this is the case, highlight the correct city and press ENTER to continue.

8. The **Confirm Route To** screen appears. This screen shows the address of the input destination. If this is your desired destination, highlight "OK" and press ENTER. The system will now calculate your route for you.



9. When your route has been calculated, the **Map** screen will appear. You are now ready to begin traveling to your desired destination.

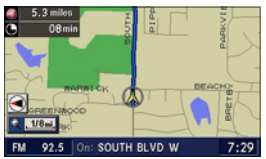
10. Proceed to the highlighted route. The destination will be marked with a bull's-eye.

NOTE: For more information about the screens used in this example and the options associated with them, please refer to the appropriate section in this manual.

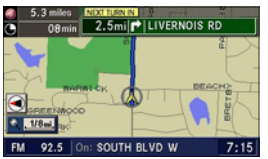
Guidance Screens

After a route has been calculated, one of 4 map screens appears, depending on how you have chosen to set the map display (See “System Settings” for instructions on how to set the map display):

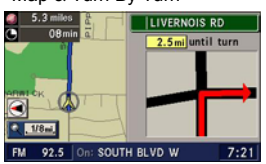
Map



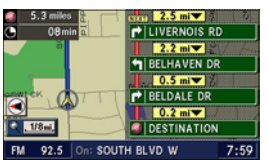
Map & Next Turn



Map & Turn By Turn



Map & Turn List



All the screens display a detailed road map that shows the current street name, the distance remaining to the destination, the time remaining to the destination or the estimated arrival time, and the direction of travel.

To increase or decrease the route magnification, turn the Select Encoder. The Zoom Scale at the bottom left of the screen will expand. The Zoom Scale will time out after 5 seconds. You may also press CANCEL to dismiss the Zoom Scale.

The icon shows your direction of travel.

NOTE: If you are in “Vehicle Heading Up” mode and the map scale is 50-350 miles (100-700 km), the map orientation will automatically change to the “True North Up” mode.

NOTE: When traveling in an unverified area turn-by-turn guidance is not available, so the **Turn By Turn/Next Turn/Turn List** screens will not be displayed in these areas. (See “Route Guidance in an Unverified Area” for details.)

In-Motion Operation

Your navigation system is equipped with a safety feature that limits the availability of certain navigation tasks while the vehicle is traveling at or above 10 miles per hour (16 km). Programmable options such as editing the personal address book or inputting a destination will be unavailable and grayed until the vehicle speed is less than 10 miles per hour (16 km).

Destination Entry screen: "Street Address", "City Center", "Point on Map", "Phone Number", and "Intersection" are grayed and unavailable. You can access the Address Book but ONLY the 4 addresses that are saved in the In-Motion Address Book folder (See "Address Book" for details.). If the In-Motion Address Book folder is empty, "Address Book" will be grayed and unavailable.

Point of Interest (POI) selection is limited; you can choose from a list of the 3 closest POIs in each In-Motion category (Airports, ATMs, Gas/Fuel Stations, Hotels & Motels, Rest Areas, and Restaurants).

Recent Route screen: Only the last 5 recent routes are available.

Trip Itinerary screen: "Edit Itinerary" is grayed and unavailable.

Confirm Route To screen: "Options" will be grayed and unavailable.

Personal Menu screen: The "Customize Personal Menu" function is not available. If a POI category is accessed only the 3 nearest in each category will be displayed.

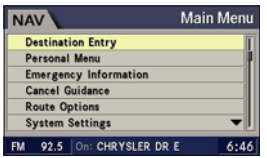
Emergency Information screen: Only the 3 nearest facilities in each category are displayed.

Routing Options screen: "View Destination" is grayed and unavailable. Only the topmost 4 turns are displayed in the "Avoid Road/View Turn List" function.

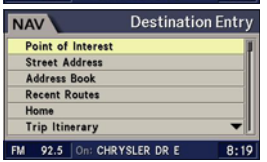
NOTE: If you continue to input information in the In-Motion mode, the system will display a message prompting you to press CANCEL or MENU. Please note that pressing either of these buttons will cause your input information to be deleted. To prevent this information from being lost, do not press CANCEL or MENU and wait until the vehicle speed is less than 10 miles per hour (16 km) before inputting any further information.

This section describes how to input your destination. The destination can be input in one of 10 different ways.

1. Highlight "Destination Entry" and press ENTER.



2. The **Destination Entry** screen appears.



3. Select desired mode.

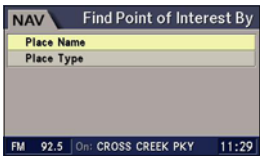
Point of Interest

This feature allows you to select a destination from a list of locations and public places, or point of interest (POI). You can search by place name (if known), or by category or place type.

NOTE: The DVD-ROM that is included with your system contains the most recent map data available at the time of production. Because of changes in streets and neighborhoods, there may be situations where the system is not able to locate the desired destination by the entry method you have chosen. If this occurs, choose another entry method.

1. Select "Point of Interest" from the **Destination Entry** screen and press ENTER.

2. The **Find Point of Interest by** screen appears. There are two options on this screen: "Place Name" or "Place Type".



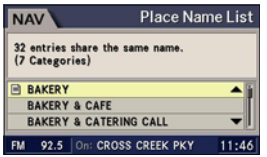
If you know the name of the destination, select "Place Name". If you wish to search by category, select "Place Type". Press ENTER.

Selecting a POI by Place Name

1. Upon selecting the Place Name option, the **Input Place Name** screen appears. Use the Select Encoder to select the first character of the place name. Press ENTER. The character will appear in the text window. Input the rest of the place name. Highlight "Name List". Press ENTER.

NOTE: Make sure you input the exact name into the system. If the name is spelled wrong or is missing characters (i.e. apostrophe, dash, space), the system may route you to the wrong location.

2. The **Place Name List** screen appears. Scroll through the list. Select the desired location. Press ENTER.



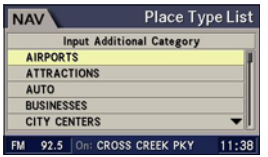
   If there is more than one location to a place name, the system will display the number of locations available. In that case, highlight the desired place name and press ENTER. Subsequent screens allow you to sort by distance or city name.

3. The **Confirm Route To** screen appears showing the address of the selected destination. If it is correct, select "OK". Press ENTER. The system will calculate a route to the destination.

NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

Selecting a POI by Place Type

1. Upon selecting the Place Type option, the **Place Type List** screen appears. Use the Select Encoder to locate the desired category. Press ENTER.



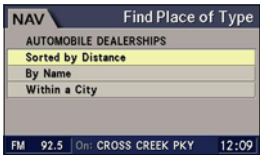
NOTE: If you don't find the name of the category in this list, select "Input Additional Category" and input the name of the desired category. A list beginning with the closest match will appear. Make your selection from this list and continue.

NOTE: When you select Restaurant as your place type, you will be prompted to choose a type of restaurant.

2. If your selection contains subcategories, a screen displaying a list of those categories appears. Select a subcategory and press ENTER.

NOTE: POI categories may contain up to 3 subcategory levels.

3. The **Find Place of Type** screen appears. You may search for place type in 3 ways:



   - Select "Sorted by Distance" to view the locations closest to the vehicle's position.
   - Select "By Name" to find locations by a specific name. The **Input Place Name** screen appears. Use the Select Encoder to spell out the name of the POI. Highlight "Name List" and press ENTER.
   - Select "Within a City" to find locations within a particular city. The **Input City Name** screen appears. Use the Select Encoder to spell out the name of the city. Highlight "City List" and press ENTER.

     NOTE: If more than 3 POIs exist in the selected city, the **Input Place** Name screen will appear. Input the POI name or select "Name List" to view a list of all POIs.

4. The **Place Name List** screen appears, showing a list of place names for the selected category. Select the desired location and press ENTER.

5. The **Confirm Route To** screen appears showing the address of the selected destination. If it is correct, select "OK". Press ENTER. The system will calculate a route to the destination.

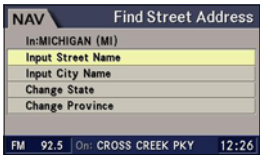
NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

Street Address

If you know the address of the destination, the system can calculate the route to that address.

1. Select "Street Address" from the **Destination Entry** screen and press ENTER.

2. The **Find Street Address** screen appears:



- Select “Input Street Name” to find a street address by inputting the street name and house or building number, if known. For this example, the “Street Name” input method is used.
- Select “Input City Name” if you want to search for an address in a particular city. Use this option for a more direct search.
- Select “Change State” to search for an address in a different state.
- Select “Change Province” to search for an address in a Canadian province.

3. Highlight “Input Street Name” and press ENTER.

NOTE: The procedure for searching by City Name is similar to the Street Address procedure. Instead of inputting address information, however, input the name of a city. Follow the screens until you have input your city name. You will then be directed to input the street name.

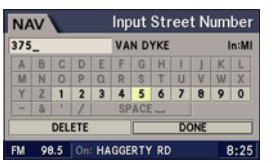
4. The **Input Street Name** screen appears. Use the Select Encoder to spell out the street name. Highlight the first letter of the street name. Press ENTER.

NAV
Input Street Name
VAN_
In:MI
191
A B C D E F G H I J K L
M N O P Q R S T U V W X
Y Z 1 2 3 4 5 6 7 8 9 0
- & ' / SPACE _
DELETE
STREET LIST
FM 92.5 On: CHRYSLER DR E 7:08

5. The selected character appears in the text window. Input the rest of the name. Select “Street List” to continue.

6. The **Street List** screen appears. Select a street name and press ENTER.

7. The **Input Street Number** screen appears if there is a number associated with the address. Use the Select Encoder to input the address number. When you are finished, highlight


NAV
Input Street Number
375_
VAN DYKE
In:MI
A B C D E F G H I J K L
M N O P Q R S T U V W X
Y Z 1 2 3 4 5 6 7 8 9 0
- & ' / SPACE _
DELETE
DONE
FM 98.5 On: HAGGERTY RD 8:25

"Done" and press ENTER.

NOTE: If the chosen address is in more than one city, the **City List** screen will appear. If this is the case, highlight the correct city and press ENTER to continue.

8. The **Confirm Route To** screen appears showing the address of the selected destination. If it is correct, select "OK" and press ENTER. The system will calculate a route to the destination.

NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

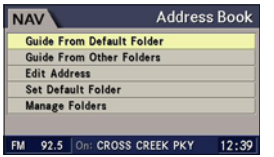
Address Book

If a location has already been placed into your personal address book, you can recall that address for use as a destination. (See "Using the Options Menu" for instructions on adding addresses to the address book.) You can also use this feature to change or delete items in the address book and manage your address book folders.

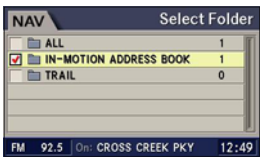
Entering an Address Using the Address Book

1. Select "Address Book" from the **Destination Entry** screen and press ENTER.

2. The **Address Book** screen appears. To select an address from the Default folder, select "Guide from Default Folder" (see "Setting the Default Folder" for details) and press ENTER.



To select an address from another folder, select "Guide From Other Folders". Choose a folder. Press ENTER.



3. Select an address.

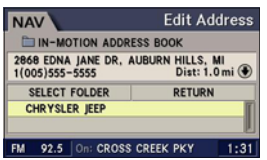
NOTE: If there are no entries in the address book, only "Set Default Folder" or "Manage Folders" will be available.

4. The **Confirm Route To** screen appears showing the address of the selected destination. If it is correct, select "OK" and press ENTER. The system will calculate a route to the destination.

NOTE: Select "Options" to add this address to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

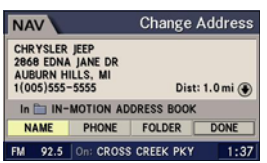
Editing the Address Book

1. From the **Address Book** screen, highlight "Edit Address" and press ENTER. .
2. The **Edit Address** screen appears. Scroll through the list of addresses and highlight the one you wish to edit. Press ENTER.



NOTE: If the address is located in a folder, highlight "Select Folder" and press ENTER. Highlight a folder and press ENTER. Select an address and press ENTER.

3. The **Confirm Address** screen appears. Select "Change" and press ENTER.
4. The **Change Address** screen appears.



- Select "Name" to change the name of the entry. Use the Select Encoder to change the name. Highlight "Done" and press ENTER.
- Select "Phone" to change the phone number. Use the Select Encoder to change the phone number. Highlight "Done" and press ENTER.
- Select "Folder" to assign the entry to a new folder. The **Select Folder** screen appears. Select the folder that you wish to place the address in. Press ENTER. The **Change Address** screen appears showing the new folder.

NOTE: If the selected address is a Trail address, only the change name option is available.

5. Select "Done" and press ENTER. The **Edit Address** screen appears. Select "Return" and press ENTER.

Deleting Items From the Address Book

1. From the **Address Book** screen, highlight "Edit Address" and press ENTER.
2. The **Edit Address** screen appears. Scroll through the list of addresses and highlight the one you wish to delete.

Press ENTER.

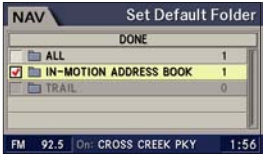
NOTE: If the address is located in a folder, highlight "Select Folder" and press ENTER. Highlight a folder and press ENTER. Select an address and press ENTER.

3. The **Confirm Address** screen appears. Select "Delete" and press ENTER.
4. A confirmation screen appears. Highlight "Yes" and press ENTER to delete the address.

Setting the Default Folder

The In-Motion Address Book folder is automatically set as the default folder. Use this feature to change the default folder.

1. From the **Address Book** screen, highlight "Set Default Folder" and press ENTER.
2. The **Set Default Folder** screen appears. Highlight the folder you wish to set as the default folder and press ENTER. A red checkmark shows that you have designated this folder as the default folder.

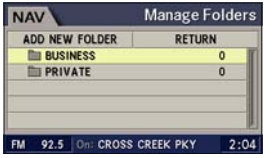


3. Select "Done" when finished and press ENTER.

Adding Address Book Folders

The Address Book has 3 permanent folders: "All", "In-Motion Address Book", and "Trail". Use this feature to add your own folders to the Address Book. You can create up to 7 folders.

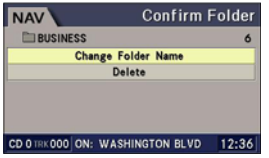
1. From the **Address Book** screen, highlight "Manage Folders" and press ENTER.
2. The **Manage Folders** screen appears. Highlight "Add New Folder" and press ENTER.



3. The **Input Folder Name** screen appears. Using the Select Encoder, input a folder name. Select "Done" when finished. Press ENTER.
4. The **Manage Folders** screen appears showing the folder name and number of addresses in the folder.

Changing Folder Name

1. From the **Address Book** screen, highlight "Manage Folders" and press ENTER.
2. The **Manage Folders** screen appears. Highlight the folder that you wish to change and press ENTER.
3. At the **Confirm Folder** screen highlight "Change Folder Name" and press ENTER.



4. The **Change Folder Name** screen appears. Use the Select Encoder to change the folder name. When finished, select "Done" and press ENTER.
5. The **Manage Folders** screen appears showing the new folder name.

Deleting Address Book Folders

1. From the **Address Book** screen, highlight "Manage Folders" and press ENTER.
2. The **Manage Folders** screen appears. Highlight the folder that you wish to delete and press ENTER.
3. At the **Confirm Folder** screen highlight "Delete" and press ENTER.

4. A confirmation screen appears. Select "Yes" to delete the folder.

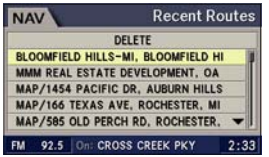
Recent Route

If your destination is one of the 11 most recent route calculations you can use the Recent Route feature to recall that destination.

NOTE: If there are no recent routes in the system, "Recent Route" will be grayed and unavailable. The Home address cannot be saved in the Recent Route list.

1. At the **Destination Entry** screen, select "Recent Routes". Press ENTER.

2. The **Recent Routes** screen appears. A list of up to 11 most recent destinations is displayed. Use the Select Encoder to highlight the desired destination. Press ENTER.



3. The **Confirm Route To** screen appears showing the address of the selected destination. If it is correct, select "OK". Press ENTER. The system will calculate a route to the destination.

NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

Editing the Recent Route List

Select this option if you want to delete items from your recent route list.

1. From the **Recent Routes** screen, highlight "Delete" and press ENTER.

2. The **Delete Recent Routes** screen appears. Highlight the address that you want to delete and press ENTER. To delete all the addresses in the Recent Route list, highlight "Delete All" and press ENTER.

3. A confirmation screen appears. Select "Yes" to delete. When finished, highlight "Return" and press ENTER.

Home

This option allows you to recall a saved address as your destination.

Setting the Home Designation

Follow this procedure when there is no address in Home.

1. From the **Destination Entry** screen select "Home" and press ENTER.

2. A screen will appear prompting you to set the home address.

3. Follow the screens to enter in the address information. Once the address is set, the **Destination Entry** screen will appear.

Saving a Destination as Home

1. Enter a destination into the system (e.g. intersection, street address, etc.).
2. At the **Confirm Route To** screen, select "Options" and press ENTER.
3. Select "Save as Home" and press ENTER.
4. If an address is already designated as the home address, a confirmation message appears. Highlight "Yes" to change the Home Designation.
5. The **Confirm Route To** screen appears, showing the home address information.

Using Home as the Destination

1. At the **Destination Entry** screen select "Home" and press ENTER.
2. The **Confirm Route To** screen appears, showing the home address information.
3. Highlight "OK" and press ENTER.

NOTE: If the Home Designation is located in an unverified area, a message will appear. To prevent this message from appearing each time you select the Home Designation as your destination, highlight "OK & Don't Remind".

Deleting the Home Designation

1. At the **Destination Entry** screen select "Home" and press ENTER.
2. At the **Confirm Route To** screen select "Options" and press ENTER.
3. Select "Delete as Home" and press ENTER.
4. A confirmation message appears. Select "Yes" to delete the address.

NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, or change route options. (See "Using the Options Menu" for details.)

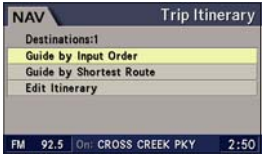
Trip Itinerary

If you are traveling to multiple destinations, the Trip Itinerary function will calculate the most efficient route. Up to 11 destinations can be stored in Trip Itinerary.

1. Add destinations to your trip itinerary list (see "Using the Options Menu" section).
2. From the **Destination Entry** screen, select "Trip Itinerary". Press ENTER.

NOTE: If there are no destinations stored in the trip itinerary, "Trip Itinerary" will be grayed and unavailable.

3. The **Trip Itinerary** screen appears.



   - To travel to your destinations in the order in which they are listed, select "Guide by Input Order" and press ENTER.
   - To let the navigation system calculate the shortest route between destinations, highlight "Guide by Shortest Route" and press ENTER.
4. The **Confirm Route To** screen appears showing the address of the first destination. If it is correct, select "OK". Press ENTER. The system will calculate a route to the destination.
5. When you reach your destination, the system will prompt you to your next destination depending upon the following conditions:
   - If you turn the ignition off, the system will prompt you to confirm the next destination upon turning the ignition on again.
   - If you do not turn the ignition off press CANCEL or wait 10 seconds. The system will then prompt you to confirm the next destination before calculating the route to your destination.

NOTE: If you press another button instead of CANCEL, you will have to re-enter the trip itinerary from the **Destination Entry** screen.

NOTE: If you wish to change the Trip Itinerary or view the Trip Itinerary List, highlight "Options" and press ENTER. (See "Using the Options

Menu" for details.)

Editing the Trip Itinerary
Select this option if you want to delete items from your Trip Itinerary.

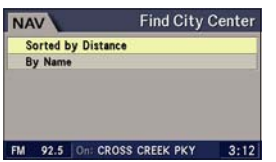
1. At the **Destination Entry** screen, highlight "Trip Itinerary" and press ENTER.
2. The **Trip Itinerary** screen appears. Select "Edit Itinerary" and press ENTER.
3. The **Edit Itinerary** screen appears. Highlight the destination that you want to delete and press ENTER. To delete all the destinations in the Trip Itinerary, highlight "Delete All" and press ENTER.

4. A confirmation screen appears. Select "Yes" to delete. When finished, highlight "Return" and press ENTER.

City Center

Use this option if you want directions to a particular city. The navigation system will calculate a route with the destination at the center of the city.

1. At the **Destination Entry** screen, highlight "City Center" and press ENTER.
2. The **Find City Center** screen appears.
   - To view a list of cities nearest to your vehicle position, select "Sorted by Distance" and press ENTER.



   - To find a specific city, select "By Name" and press ENTER. Input the city name, highlight "City List" and press ENTER.

3. At the **City List** screen select the city you wish to travel to and press ENTER.

4. The **Confirm Route To** screen appears showing the selected city and city center address. Select "OK" and press ENTER The system will calculate a route to the destination.

NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

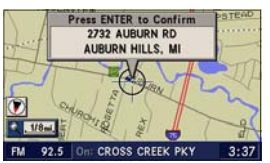
Point on Map

This feature allows quick and easy selection of a destination directly from the **Map** screen. By selecting a street segment or icon, you can quickly enter a destination without the need to input the city name or street.

1. From the **Destination Entry** screen, select "Point on Map". Press ENTER.
2. The **Map** screen appears. Move the Select Encoder in the direction you want to move. The cursor will scroll through the map until you release the Select Encoder.

NOTE: To move greater distances on the map, turn the Select Encoder to increase the zoom scale.

3. When you have located your destination, release the Select Encoder and press ENTER.
4. A call-out balloon appears showing the address of the location. If you chose a POI icon the name will appear in a Place Name List.



5. Press ENTER again to select the location.

6. The **Confirm Route To** screen appears showing the address of the selected destination. If it is correct, select "OK" and press ENTER. The system will calculate a route to the destination.

NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

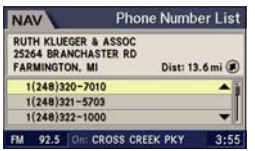
Phone Number

If you know the phone number of the destination, you can use this function to find the address. This function is available only when the phone number is stored in your personal address book or is listed in the database.

NOTE: The system contains a database of Yellow Page business listings. It does not contain White Page listings.

1. From the **Destination Entry** screen select "Phone Number". Press ENTER.
2. The **Input Phone Number** screen appears. Use the Select Encoder to highlight the first number of the phone number. Press ENTER. Input the rest of the phone number. Select "Phone List". Press ENTER.

3. The **Phone Number List** screen appears. Use the Select Encoder to select the phone number of the desired destination. Press ENTER.



4. The **Confirm Route To** screen appears showing the address of the selected destination. If it is correct, select "OK". Press ENTER. The system will calculate a route to the destination.

NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

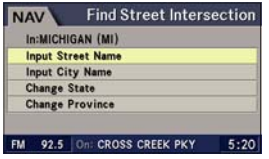
Street Intersection

If you know the intersection near where you want to travel, you can input two cross street names as your destination.

1. From the **Destination Entry** screen, select "Street Intersection". Press ENTER.

2. The **Find Street Intersection** screen appears.

   - Select "Input Street Name" to find an intersection by inputting street names. For this example, the "Input Street Name" input method is used.



   - Select "Input City Name" if you want to search for the intersection in a particular city. Use this option for a more direct search.

   - Select "Change State" to search for an intersection in a different state.

   - Select "Change Province" to search for an intersection in a Canadian province.

3. Highlight "Input Street Name" and press ENTER.

NOTE: The procedure for searching by City Name is similar to the Street Name procedure. Instead of inputting a street name, however, input the name of a city. Follow the screens until you have input your city name. You will then be directed to input a street name.

4. The **Input 1st Street Name** screen appears. Use the Select Encoder to spell out the street name. Highlight the first letter of the street name. Press ENTER.

NAV
Input 1st Street Name
GREE_
In:MI
160
A B C D E F G H I J K L
M N O P Q R S T U V W X
Y Z 1 2 3 4 5 6 7 8 9 0
- & ' / SPACE
DELETE
STREET LIST
FM 92.5
On: CROSS CREEK PKY
5:27

5. The selected character appears in the text window. Repeat this process until the name is spelled out. Select "Street List" to continue.

6. The **Street List** screen appears. Select a street name and press ENTER.

7. The **Input 2nd Street Name** screen appears. Use the Select Encoder to spell out the cross street name. When you

are finished, highlight "Street List" and press ENTER.

8. The **Street List** screen appears. Select the desired street and press ENTER.

9. The **Confirm Route To** screen appears showing the selected intersection. If it is correct, select "OK" and press ENTER. The system will calculate a route to the intersection.

NOTE: Select "Options" to save this address in your Address Book, add it to your Trip Itinerary, add the destination or the POI place type to your Personal Menu, change route options, or save it as your home position. (See "Using the Options Menu" for details.)

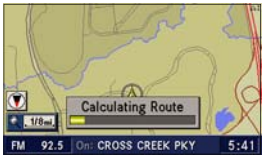
Normal Route Guidance (Verified Area)

After you have input your destination information into the system, the **Confirm Route To** screen appears. This screen displays the name and address of your destination, as well as the current routing method. At the bottom of the screen are 3 "buttons": "OK", "Show Map", and "Options":

- Select "OK" to proceed to route calculation.
- Select "Show Map" to verify or modify the location of your destination on the map.
- Select "Options" to save the location in your address book, add the destination to your trip itinerary, add the destination or POI category to your Personal Menu, change the routing method, or save the destination as the home position (see "Using the Options Menu" for details).

1. To calculate your route, select "OK" and press ENTER.

2. The system calculates the route, displaying the progress of the route calculation. When the route calculation is complete, the screen will switch to the guidance map.



NOTE: To cancel the route calculation, press the CANCEL button.

3. Proceed to the highlighted route. Route guidance is now in progress. Using voice prompts, the system will notify you of upcoming turns and maneuvers.

NOTE: When 2 maneuvers occur close together, the frequency and type of guidance prompt is based on the distance between maneuvers and the speed limit of the road.

4. While in guidance mode use the **Route Options** menu to create a detour, view a list of route maneuvers, avoid a road, change the routing method, or view the destination (See "Routing Options" for details).

Route Guidance in an Unverified Area

Route guidance in an unverified area is different from the guidance you receive in a detailed, verified area. When traveling in an unverified area, turn-by-turn guidance and voice prompts are unavailable. Instead, point-to-point guidance is activated to help you reach your destination.

There are several instances in which you would receive route guidance in an unverified area:

- The route starting point is located in a verified area but the destination is located in an unverified area,
- The route starting point and destination are both located in an unverified area, or
- The route starting point is located in an unverified area and the destination is located in a verified area.

Please refer to the next page for more information on route guidance in these areas.

When driving on an unverified road, you will see on the map display a dotted line extending from the vehicle position to the destination point. This line serves as your guide as you travel by showing the direction of the destination.

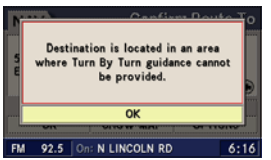
The **Map** screen will still show your vehicle position and a map of the area you are in. The road name (if available) will be displayed at the bottom of the screen but the estimated time remaining/to arrival display will be unavailable.

Unverified roads are only visible on the map display at 1/20 mile and 1/8 mile scale.

Starting Point is in a Verified Area but Destination is Located in an Unverified Area

1. Select "OK" at the **Confirm Route To** screen and press ENTER.

2. A message will appear informing you that the destination is located in an area where turn-by-turn guidance cannot be provided. Press ENTER to accept.



3. The system calculates the route, displaying the progress of the route calculation. When the route calculation is complete, the screen will switch to the guidance map.

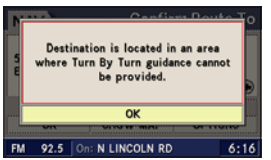
4. Follow normal route guidance. A voice prompt will alert you when you are nearing the unverified area.

5. When you are in the unverified area, the top of the **Map** screen will display "Map not Verified" and you will see a dotted line extending from the vehicle position. You will no longer receive turn-by-turn instructions.

6. Follow the direction of the dotted line to reach your destination, making turns and maneuvers at your own discretion.

Starting Point and Destination Are Both Located in an Unverified Area

1. Select "OK" at the **Confirm Route To** screen and press ENTER.
2. A message will appear informing you that the destination is located in an area where turn-by-turn guidance cannot be provided. Press ENTER to confirm.



3. The system calculates the route, displaying the progress of the calculation. When the calculation is complete, the screen will switch to the **Map** screen.
4. A voice prompt will notify you that you are traveling in an unverified area and that turn-by-turn guidance cannot be provided.
5. The top of the **Map** screen will display "Map not Verified" and you will see a dotted line extending from the vehicle position.

6. Follow the direction of the dotted line to reach your destination, making turns and maneuvers at your own discretion.

NOTE: Guidance will be provided for any portion of the route that is located in a verified area.

Starting Point is in an Unverified Area and Destination is in a Verified Area

1. Select "OK" at the **Confirm Route To** screen and press ENTER.
2. The system calculates the route, displaying the progress of the route calculation. When the route calculation is complete, the screen will switch to the guidance map.

3. A voice prompt will notify you that you are traveling in an unverified area and that turn-by-turn guidance cannot be provided.
4. The top of the **Map** screen will display "Map not Verified" and you will see a dotted line extending from the vehicle position.

5. Follow the direction of the dotted line, making turns and maneuvers at your own discretion, until you reach the highlighted route and normal route guidance resumes.
6. Follow the voice prompts and turn-by-turn guidance to reach your destination.

Refreshing the Route

If you deviate from the direction of the destination while you are in an unverified area, the system will display a message prompting you to "Refresh Route".

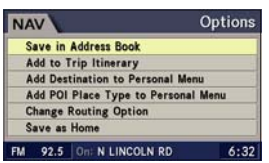
Refreshing the route will rematch the distance between the vehicle position and the destination and redirect you to your chosen destination. Press ENTER to refresh the route.

NOTE: If you deviate from the route while in a verified area, the system can recalculate the route to get you back on the way to your destination. (See "Setting Reroute Options" for details.) .

Using the Options Menu

Before you proceed to route calculation, you can save the destination in your Address Book, add the destination to your Trip Itinerary, add the destination or POI category to your Personal Menu, change the routing method, or save the destination as the home position.

1. Input a destination.
2. At the **Confirm Route To** screen highlight "Options" and press ENTER.
3. The **Options** screen appears. Highlight the desired option.



Adding a destination to the Address Book

The Address Book can store up to 100 addresses and phone numbers.

1. Highlight "Save in Address Book" and press ENTER.

NOTE: If the Address Book is full, "Save in Address Book" will be grayed and unavailable.

2. The **Input Name** screen appears. Use the Select Encoder to spell out the name you would like to see in the address book. Select "Done" when finished and press ENTER.

NOTE: If a Point of Interest is selected, the Point of Interest name will automatically appear in the Input Name screen. If you wish to rename the entry, use the select Encoder to select "Delete". When the entry name has been erased, you can enter a new name.

3. The **Input Phone Number** screen appears. Use the Select Encoder to input the phone number of the address. When the number is complete, or if you do not know the phone number, highlight "Done" and press ENTER.

4. The **Confirm Address** screen appears. Select "Save" to store the name, address, and phone number in the displayed address folder. To save the address to a different folder, highlight "Change Folder" and press ENTER. Select the desired folder and press ENTER.

NOTE: When the vehicle is in the In-Motion mode the only addresses that are available are the addresses stored in the In-Motion Address Book Folder. This folder holds 5 addresses. It is suggested that you save your 5 most frequent destinations in the In-Motion Address Book Folder.

5. The name, address, and phone number are now stored in the address book. The **Confirm Route To** screen will reappear showing the destination information.

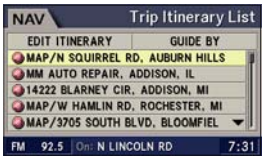
Adding an address to Trip Itinerary

Up to 11 addresses can be added to the Trip Itinerary.

1. Highlight "Add to Trip Itinerary". Press ENTER.

NOTE: If the current destination has been set using the Trail function, or if the Trip Itinerary list is full, "Add to Trip Itinerary" will be grayed and unavailable.

2. The **Trip Itinerary List** screen appears with the added destination highlighted. Press ENTER.



3. The **Destination Entry** screen appears. To add more entries to Trip Itinerary, input a destination then repeat this procedure.

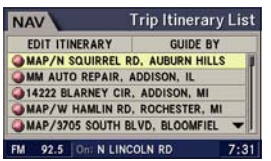
Deleting An Address From the Trip Itinerary

1. At the **Trip Itinerary List** screen select "Edit Itinerary" and press ENTER.
2. The **Edit Itinerary** screen appears showing a list of Trip Itinerary destinations. Highlight the destination you wish to delete and press ENTER. To delete all the destinations in the Trip Itinerary, highlight "Delete All" and press ENTER.
3. A confirmation screen appears. Select "Yes" to delete and press ENTER. When finished, highlight "Return" and press ENTER.

Changing Trip Itinerary Order
Before you enter Trip Itinerary mode you can change the trip itinerary order in 2 different ways: by selecting a destination from the trip itinerary list to be the first destination or by choosing "Guide By" at the **Trip Itinerary List** screen.

Choosing a Destination from the List

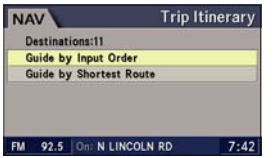
1. At the **Trip Itinerary List** screen highlight the destination you want to travel to first. Press ENTER.



2. The **Confirm Route To** screen appears showing the new destination information. The remaining destinations in the Trip Itinerary will be shifted after this one depending on the guidance method selected.

Guide By Method

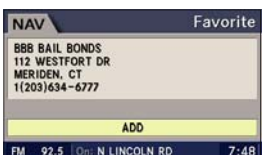
1. At the **Trip Itinerary List** screen highlight "Guide By" and press ENTER.
2. Select the desired option and press ENTER.



3. The **Confirm Route To** screen appears showing the first destination of the Trip Itinerary.

Adding a Destination to the Personal Menu
Up to 5 destinations or POI place types can be stored in the Personal Menu.

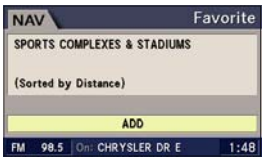
1. Highlight "Add Destination to Personal Menu" and press ENTER.
2. The **Favorite** screen appears showing the name and address of the destination. Press ENTER to save the address in the Personal Menu.



Adding a POI Place Type to the Personal Menu
Use this option to add a favorite POI category to the Personal Menu.

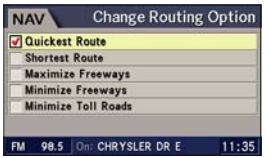
NOTE: If the destination is not a POI, this option is grayed and unavailable.

1. Highlight "Add POI Place Type to Personal Menu" and press ENTER.
2. The **Favorite** screen appears showing the category name of the POI. Press ENTER to save the category in the Personal Menu.



Changing Routing Option
This feature allows you to customize your route by selecting the quickest or shortest route, minimizing or maximizing freeway travel, or minimizing toll roads. Only one option at a time may be chosen.

1. Highlight "Change Routing Option" and press ENTER.
2. Select the desired mode. Press ENTER.



3. The new routing method will now be shown on the **Confirm Route To** screen. The system will calculate the route using the new routing information.

Save a Destination as Home
This feature allows you to save a destination as the Home position.

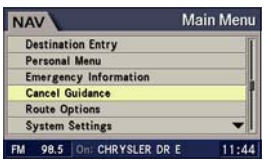
1. Select "Save as Home" and press ENTER.
2. If an address is already designated as the home address, a confirmation message appears. Highlight "Yes" to change the home position.
3. The **Confirm Route To** screen appears displaying the current address as the home position.

Canceling Route Guidance

The navigation system will guide you to your desired destination until you arrive. However, if you wish to cancel route guidance, you can use this feature to do so.

NOTE: This option is only available when a destination has been calculated. If there is no destination currently entered into the system, this option will be grayed and unavailable.

1. Press the NAV button to get to the **Main Menu** screen.
2. At the **Main Menu** screen select "Cancel Guidance" and press ENTER.



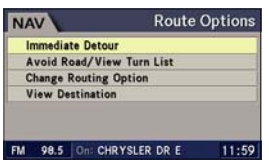
3. A confirmation screen appears. Select "Yes" to cancel guidance.

NOTE: Pressing the CANCEL button at the **Map** screen will also cancel route guidance.

NOTE: If you are in Trip Itinerary mode, a message appears asking if you wish to cancel the whole trip itinerary or just the current destination. If you choose "Cancel Trip Itinerary" the trip itinerary will be cancelled. If you choose "Delete Current Destination" the **Confirm Route To** screen will appear with the address of your next destination.

At the Route Options menu you can change route properties once you have chosen your destination. This screen is available **only** when a destination is mapped in. From this screen you can create a detour, display a list of directional route maneuvers, change the method of travel, and view your destination on the map.

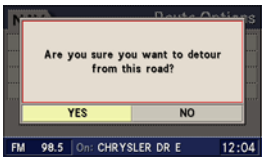
1. At the **Main Menu** screen highlight "Route Options". Press ENTER
2. The **Route Options** screen appears.
3. Select the desired mode.



Creating an Immediate Detour

When you encounter an undesirable road condition, you can use the Detour option to calculate a different route, if possible, from the next intersection for 1 mile on surface streets and 5 miles on freeways.

1. To create a detour, select "Immediate Detour" from the **Route Options** screen. Press ENTER.
2. A confirmation screen appears. Select "Yes" to create a detour. Press ENTER.



3. The system will then re-calculate the route.

Avoid Road/View Turn List

The View Turn List feature allows you to view upcoming turns and street names along the route to your destination. The Avoid Road feature allows you to select roads in the maneuver list that you wish to avoid.

Viewing the Turn List

1. Highlight "Avoid Road/View Turn List" from the **Route Options** screen. Press ENTER.

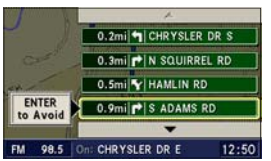
2. A screen appears showing a list of route maneuvers. To scroll up and down through the list, highlight the up or down arrow and press ENTER.

3. To return to the Map display, press the CANCEL button 3 times.

Avoiding Roads

The avoid road feature allows you to select roads in the maneuver list that you wish to avoid.

1. Highlight "Avoid Road/View Turn List" from the **Route Options** screen. Press ENTER.
2. A screen appears showing all the maneuvers of your route. Select the road that you wish to avoid. Press ENTER.

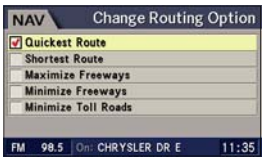


3. The system will recalculate the route.

Changing Current Routing Method

This screen allows you to customize the route by selecting the quickest or shortest route, minimizing or maximizing freeway travel, or minimizing toll roads. Only 1 option at a time may be chosen.

1. To change the current routing method, select "Change Routing Option" from the **Route Options** screen.
2. The **Change Routing Options** screen appears. Select the desired mode.



- **Quickest Route**: Calculates the shortest driving time.
- **Shortest Route**: Calculates the shortest distance between two points.
- **Maximize Freeways**: Makes the most efficient use of freeways.
- **Minimize Freeways**: Uses mostly surface streets.

- **Minimize Toll Roads**: Uses the least number of pay roads.

3. Press ENTER. The system will now use the new routing information when calculating a route.

Viewing the Destination

1. Highlight "View Destination" and press ENTER.

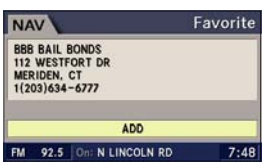
2. The **Map** screen appears showing your destination.

The Personal Menu can store up to 5 favorite addresses, favorite intersections, favorite POIs, or POI categories. You can add a POI category either at the **Options** menu or at the "Customize Personal Menu" screen of the Personal Menu.

Adding destinations to the Personal Menu

Adding an Address, Intersection, or POI

1. Enter the destination (See "Destination Entry" for details).
2. At the **Confirm Route To** screen highlight "Options" and press ENTER.
3. Highlight "Add Destination to Personal Menu" and press ENTER.
4. The **Favorite** screen appears showing the name and address of the destination. Press ENTER to save the address in the Personal Menu.

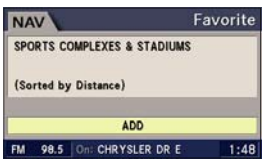


Adding a POI Category at the Options screen

Use this option to add a destination's POI category to the Personal Menu

NOTE: If the destination is not a POI, this option is grayed and unavailable.

1. Highlight "Add POI Place Type to Personal Menu" and press ENTER.
2. The **Favorite** screen appears showing the category name of the POI. Press ENTER to save the category in the Personal Menu.

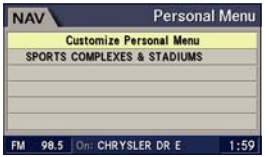


Adding a POI category at the Customize Personal Menu Screen

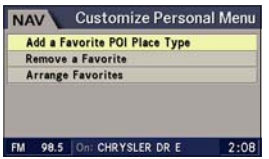
Use this option to add a favorite POI category to the Personal Menu.

1. At the **Main Menu** screen, highlight "Personal Menu" and press ENTER.

2. Highlight "Customize Personal Menu" and press ENTER.



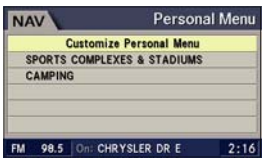
3. Highlight "Add a Favorite POI Place Type" and press ENTER.



4. Select the desired POI category and press ENTER.
5. Press ENTER to add the category to the Personal Menu.

Using the Personal Menu

1. At the **Main Menu** screen, highlight "Personal Menu" and press ENTER.
2. The "Personal Menu" screen appears showing a list of your saved destinations/POI categories.



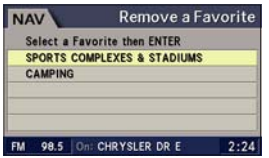
3. To travel to a saved address, intersection, or POI, select the destination and press ENTER.
4. To travel to a POI category, select the desired category and press ENTER. The **Place Name List** screen will appear showing a list of destinations in that category sorted by distance, with the closest destination appearing first. Using the select Encoder, scroll through the list to select your destination. Press ENTER.

5. The **Confirm Route To** screen appears. Press ENTER.

Deleting an Item from the Personal Menu

1. At the **Main Menu** screen, highlight "Personal Menu" and press ENTER.

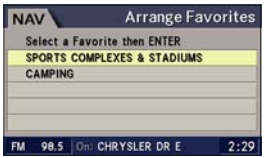
2. Highlight “Customize Personal Menu” and press ENTER.
3. Highlight “Remove a Favorite” and press ENTER.
4. Select the destination that you would like to remove from the menu and press ENTER.



5. A confirmation screen will appear. Press ENTER to remove.

Arranging Items in the Personal Menu

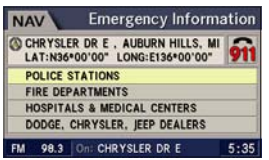
1. At the **Main Menu** screen, highlight “Personal Menu” and press ENTER.
2. Highlight “Customize Personal Menu” and press ENTER.
3. Highlight “Arrange Favorites” and press ENTER.
4. Select the item that you would like to move and press ENTER.



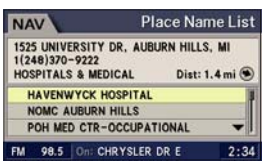
5. Using the Select Encoder, move the destination to the desired position and press ENTER. Repeat this procedure to arrange other favorites.

This feature allows you to locate the police stations, fire departments, hospitals and medical centers, nearest to your current vehicle position.

1. From the **Main Menu** screen highlight "Emergency Information" and press ENTER.
2. The **Emergency Information** screen appears showing your current position and a menu of services. Select the desired service and press ENTER.



3. If you selected an emergency service, a warning message appears. Press ENTER to continue.
4. The **Place Name List** screen appears, showing a list of the services nearest to your vehicle position.

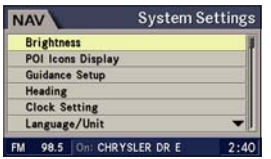


5. Use the Select Encoder to scroll through the list. As you do so you will notice that the address, phone number, and distance of the highlighted destination is displayed in the window above the list. When your selection is highlighted, press ENTER to continue.
6. The **Confirm Route To** screen appears showing the address of the selected destination. If it correct, select "OK". The system will calculate a route to the destination.

NOTE: If you need to call 911 and have a Hands Free Module (HFM) device connected to the navigation system, use the Select Encoder to highlight the

icon and press ENTER. The system will then call 911.

Select "System Settings" from the **Main Menu** screen to change screen brightness, turn on/off or change the POI icons, choose a display map, switch between the North Up and Heading Up direction function, set the clock, change the language and unit of measure, change the audio clock display size, and access the rear camera mode.

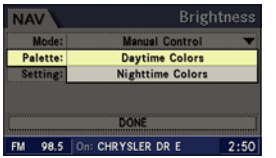


NOTE: If the battery is disconnected, all settings will return to their default positions.

Adjusting Brightness

Select "Brightness" to change the contrast of the display for night or daylight driving. You can choose to let the system control the brightness of the screen using the Automatic mode, or choose Manual Control to change the screen brightness yourself.

1. The default setting of the system is the Automatic mode. To choose Manual Control, highlight "Brightness" and press ENTER.
2. Press ENTER. Select "Manual Control" and press ENTER.
3. Highlight "Palette" and press ENTER. Choose either "Daytime Colors" or "Nighttime Colors" and press ENTER.
4. Highlight "Setting" and press ENTER. Choose a brightness level from 1 to 10 and press ENTER.

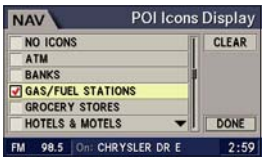


5. Select "Done" and press ENTER.

POI Icons Display

This option allows you to show or hide POI icons on the map display, or to choose which icons are to be displayed. There are 8 icons to choose from: ATMs, Banks, Gas/Fuel Stations, Grocery Stores, Hotels & Motels, Parking, Rest Areas, or Restaurants. You may select up to 8 icons to appear on the map at one time. The Gas/Fuel Station icon is turned on by default, but can be turned off.

When you select Restaurant, you can choose the type of cuisine you want. POI Icons will only appear on 1/20 and 1/8 scale maps.



1. At the **System Settings** screen highlight "POI Icons Display" and press ENTER. The **POI Icons Display** screen appears.
2. Use the Select Encoder to scroll through the list of icons.
   - To add an icon to the map display, select an icon name and press ENTER. A red checkmark will appear next to it to show that it is selected.
   - To delete an icon from the map display, select a checked icon name and press ENTER. The red checkmark will disappear.
   - To clear all the icons from the screen, highlight "Clear" and press ENTER.
4. When you are finished, select "Done" and press ENTER.

NOTE: The Gas Station icon appears on the map display by default. Select "No Icons" if you do not wish any icons to appear on the display.

Setting Guidance Properties

At the **Guidance Setup** screen you can change how the system directs you to your destination. You can select a system prompt, change the guidance map view, edit estimated time options, change rerouting methods, and adjust guidance volume.

1. From the **System Settings** screen, highlight "Guidance Setup". Press ENTER.
2. The **Guidance Setup** screen appears.

Setting Guidance Map Display

You can choose the type of map you wish to view when driving to your destination:

- Map Only: If you choose "Map Only", the system will display the Map screen and switch to the Arrow screen before a turn.

- Map and Turn by Turn: The system displays both the Map and Arrow screens at the same time.
- Map and Next Turn: The Map screen is shown with Next Turn information displayed at the top of the screen. When approaching a turn, the Next Turn is replaced by the Arrow screen.
- Map and Turn List: The Map and Turn List screens are displayed. When approaching a maneuver, the Turn List screen is replaced by the Arrow screen.

To change the map display properties, highlight the desired option and press ENTER.

Setting System Prompt

This option allows you to select the type of prompt you wish to hear along your route. You can select to hear a voice prompt, a tone prompt, a combination of both, or no prompt at all.

1. Highlight the box next to "Prompt".
2. Four options appear: Off, Voice, Tone, and Voice & Tone.
   - To turn the prompt off, highlight "Off" and press ENTER.
   - To hear only voice prompts, highlight "Voice" and press ENTER.
   - To hear only tone prompts, highlight "Tone" and press ENTER.
   - To hear a combination of both, highlight "Voice & Tone" and press ENTER.

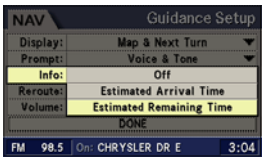
NOTE: To adjust navigation volume turn the volume knob during a voice command.

Info

This option allows you to view on the **Map** screen the estimated time you will arrive at your destination or the amount of time left until you reach your destination.

1. At the **Guidance Setup** screen highlight "Info" and press ENTER.

2. To view the estimated time of arrival, highlight "Estimated Arrival Time" and press ENTER.



3. To view the time remaining to arrival, highlight "Estimated Remaining Time" and press ENTER.

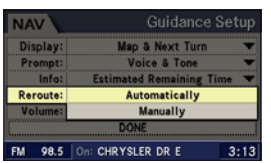
4. To display no information, highlight "Off" and press ENTER.

Setting Reroute Options

If you deviate from the suggested route, the system can recalculate a route to get you back on the way to your destination.

1. Select "Reroute" and press ENTER.

2. Select "Automatically" or "Manually". When set to "Automatically", the system will automatically recalculate a new route if you deviate from the original route. When set to "Manually", the system will prompt you to press ENTER before recalculating your route.

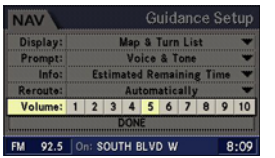


Adjusting the Volume

This option allows you to set guidance volume levels.

1. Select "Volume" and press ENTER.

2. Ten options appear: 1 being the lowest volume and 10 being the highest volume. Highlight the desired setting and press ENTER.

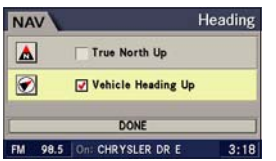

NAV
Guidance Setup
Display: Map & Turn List
Prompt: Voice & Tone
Info: Estimated Remaining Time
Reroute: Automatically
Volume: 1 2 3 4 5 6 7 8 9 10
DONE
FM 92.5 On: SOUTH BLVD W 8:09

Heading

Use this option to change how the map will display the route.

1. At the **System Settings** screen highlight "Heading" and press ENTER. The **Heading** screen appears.

2. Select a setting:



- When set to "Vehicle Heading Up", the map display will rotate so that the vehicle position icon is always pointing toward the top of the screen.
- When set to "True North Up", the map display will always show the map with north facing toward the top of the screen. The vehicle position icon will rotate on the map display.

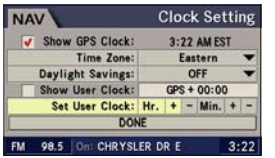
NOTE: The Vehicle Heading Up mode is not available when the zoom scale is set to 50 miles (100km) or greater.

Setting the Clock

GPS Clock

The GPS receiver used in this system is synchronized to the time data being transmitted by the GPS satellites. The satellites' clock is Greenwich Mean Time (GMT). This is the world-wide standard for time. This makes the system's clock very accurate once the appropriate time zone and daylight savings information is set.

1. At the **System Settings** screen, highlight "Clock Setting" and press ENTER. The **Clock Setting** screen appears.
2. To show the GPS clock, select "Show GPS Clock" and press ENTER.



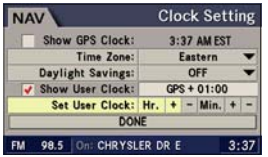
3. To adjust the time zone, Select "Time Zone" and press ENTER. Select the appropriate time zone and press ENTER.
4. To turn daylight savings on or off, select "Daylight Savings" and press ENTER. Select "On" or "Off" and press ENTER.

User Clock

If you wish to set the clock to a time different than the system clock, you can manually adjust the time by choosing the "Set User Clock" option.

1. Highlight "Set User Clock".
2. To increase the clock by hours, make sure "HR +" is highlighted and press ENTER. Press ENTER again to

increase the clock by another hour. You will see on the "Show User Clock" display the number of hours you have increased the clock by.



3. To decrease the clock by one hour, use the Select Encoder to highlight the "-" sign. Press ENTER. Press ENTER again to decrease the clock by another hour.

4. To increase the clock by minutes, make sure "MIN +" is highlighted and press ENTER. Press ENTER again to increase the clock by another minute.

5. To decrease the clock by minutes, use the Select Encoder to highlight the "-" sign. Press ENTER. Press ENTER again to decrease the clock by another minute.

6. Select "Done" to exit from the clock setting mode.

Setting a Language and Unit of Measure

The navigation system can display and prompt in 3 different languages: English, Spanish, and French. The units of measure can be displayed in either metric or US.

1. From the **Systems Setting** screen, highlight "Language/Unit". Press ENTER. The **Language/Unit** screen appears.

Language

1. The language default setting is English. To change the setting, highlight the desired language and press ENTER.

2. Select "Done". The disclaimer screen will appear in the selected language. Press ENTER. The navigation system text will now appear in the language of choice. As well, the voice prompt will command in the selected language.

Unit of Measure

1. To change the unit of measure, highlight either "US" or "Metric". Press ENTER.

2. Highlight "Done" and press ENTER.

Audio Clock Display

Select this option to change the size of the clock on the audio screens.

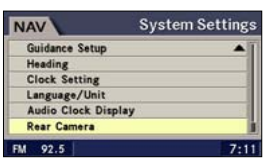
1. Select "Audio Clock Display" from the **System Settings** screen .
2. Select the desired setting and press ENTER.
3. Highlight "Done" and press ENTER.

Rear Camera Mode (If Equipped)

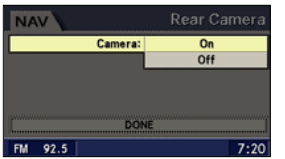
Your vehicle may be equipped with a rear view camera that allows you to see an on-screen image of the rear of your vehicle whenever the vehicle is put in reverse.

Turning the Rear Camera On

1. To access the rear camera mode, select "Rear Camera" at the **System Settings** screen and press ENTER.



2. Select "ON" at the **Rear Camera** screen. Highlight "DONE" and press ENTER. The rear camera is now enabled.



3. When the vehicle is shifted in Reverse, the **Caution** screen will appear, followed by an image of the rear of the vehicle.

4. When the vehicle is shifted out of reverse, the rear camera mode is exited and the **Navigation** or **Audio** screen appears again.

Turning the Rear Camera Off

1. To turn the rear camera off, select "Rear Camera" at the **System Settings** screen and press ENTER.

2. Select “OFF” at the “Rear Camera” screen. Highlight “DONE” and press ENTER. The rear camera is now disabled.

Default Settings

If the battery is disconnected, all settings will return to their default position:

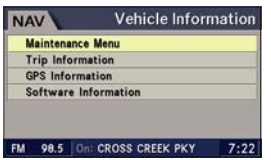
- Zoom: 1/8 mile
- Brightness: Automatic
- POI: Show, Gas/Fuel Station
- Guidance– Display: Map & Next Turn
- Guidance– Prompt: Voice
- Guidance– Info: Estimated Remaining Time
- Guidance– Reroute: Automatically
- Guidance– Volume: 5
- Heading: Vehicle Heading Up
- GPS Clock Setting: Eastern Time Zone, Daylight Saving off
- Language: English
- Units: U.S. (miles/feet)
- Rear Camera: Camera On
- Audio Clock Display: Small clock display

This feature allows you to schedule vehicle maintenance reminders, view trip information, view the number of satellites the system is receiving, and view system information.

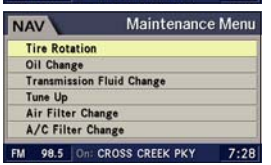
Maintenance Menu

The navigation system can be programmed to remind you when you need a tire rotation, oil change, transmission fluid change, tune up, air filter change, and air conditioner filter change.

1. Select "Vehicle Information" from the **Main Menu** screen and press ENTER.



2. Select "Maintenance Menu" and press ENTER.



3. Select the service that you wish to schedule a reminder for. Press ENTER.

4. Select "Modify" to input or modify the number of miles between services that you want the notification to appear. Press ENTER.

NOTE: Consult your vehicle owner's manual for interval recommendations.

4. The **Input Distance** screen appears. Use the Select Encoder to input the distance between notifications (100 to 999999mi/km). Select "Done" when finished and press ENTER.

5. The "Since Last" field shows you how many miles you've gone since the last notification or since the last time you reset the field. To reset this field to 0, select "Reset" and press

ENTER.

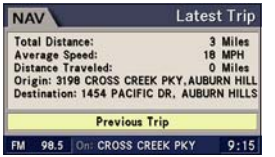
6. To turn notification on or off, select “Notification” and press ENTER. Select “On” or “Off” and press ENTER.

7. The maintenance notification is shown when the distance set in the “Between” field has been reached. If you select “Remind Again” or press CANCEL, the message will be shown again upon the next ignition cycle. If you select “OK”, the “Since Last” field will reset and the message will not be shown again.

Trip Information

This **Trip Information** screen allows you to access information about your current or previous trip: total distance, average speed, distance traveled, origin of route, and destination address.

1. Select “Vehicle Information” from the **Main Menu** screen and press ENTER.
2. Select “Trip Information” and press ENTER.
3. The **Latest Trip** screen appears, displaying your current trip information.



4. To access trip information from the last trip you took, highlight “Previous Trip” and press ENTER.

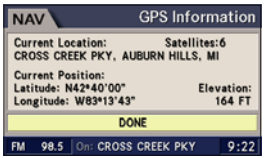
Viewing GPS Information

The **GPS Information** screen displays latitude, longitude, elevation, the number of satellites being accessed, and the road name, city, and state in which you are currently located.

NOTE: Elevation display accuracy can vary widely since the system uses only GPS signals for determining elevation approximations.

1. Select “Vehicle Information” from the **Main Menu** screen and press ENTER.
2. Highlight “GPS Information” and press ENTER.

3. The **GPS Information** screen appears.

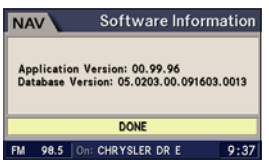


Viewing Software Information

The **Software Information** screen contains information that is useful to Technical Support in case of difficulty.

1. To view this screen, highlight "Software Information" and press ENTER.

2. The **Software Information** screen appears.

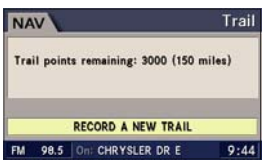


The Trail function is a feature that helps you to log and save routes in non-digitized areas. The system allows a total of 150 miles (240 kilometers) to be stored as trails. When in use, a trail appears on the **Map** screen as you drive along your route.

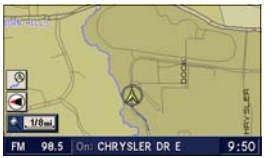
NOTE: The voice prompt and turn-by-turn guidance features are disabled when using the Trail function.

Creating a Trail

1. Press the NAV button until the **Map** screen appears.
2. Press and hold ENTER for 3 seconds.
3. The **Trail** screen appears. Press ENTER to record a trail.

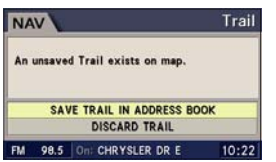


4. The **Map** screen appears. As you drive the system will begin recording your route. Every 262 feet (80 meters) the system will drop "points" and connect these points by lines. You will see your trail on the screen.



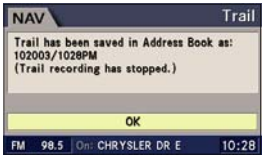
NOTE: The Trail icon appears when the Trail mode is on.

5. When you are done recording your trail, press ENTER for 3 seconds.
6. The **Trail** screen appears. Highlight "Save Trail in Address Book" to save the trail and press ENTER.



NOTE: If you do not wish to save the trail, highlight "Discard Trail". You will be taken back to the **Map** screen.

8. The trail will automatically be saved to the TRAIL folder in your address book in the following date and time format: MMDDYY/HHMM.



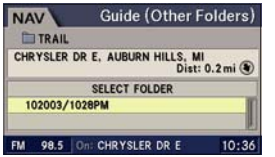
9. Press ENTER. The **Map** screen appears with the Trail function turned off.

Using a Trail as a Destination

After a trail has been recorded, you can recall the trail as a destination from your address book.

NOTE: The system uses GPS signals to map the trail data. If you are following a trail in mountainous or forested areas or other areas where the GPS signals may be blocked, the system may have trouble registering the position of your vehicle.

1. From the **Destination Entry** screen, highlight "Address Book" and press ENTER.
2. The **Address Book** screen appears. Highlight "Guide from Other Folders" and press ENTER.
3. Highlight the TRAIL folder and press ENTER. A list of addresses appears.



4. Select the trail that you wish to use. Press ENTER.
5. The **Confirm Route To** screen appears showing the name of the selected trail. Select "OK" and press ENTER.
6. Follow the directions to the starting point of the trail.
7. The **Map** screen appears displaying the selected trail. Follow the displayed trail line with care to the end of the trail.

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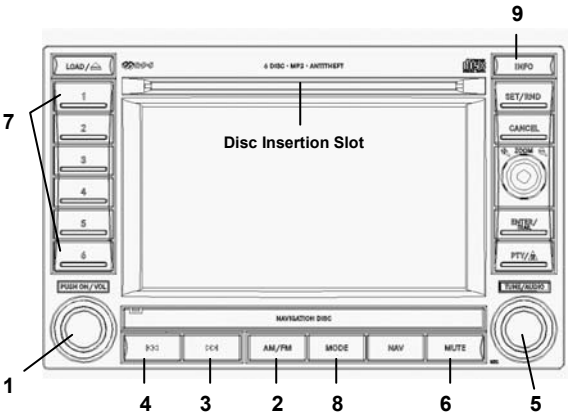
Controls and Pushbuttons



Press the PUSH ON/VOL button (1) to turn on the radio. Turn the volume control to the right to increase the volume and to the left to decrease the volume.

NOTE: Power to operate the radio is supplied through the ignition switch. It must be in the ON or ACC position to operate the radio.

Press the AM/FM button (2) to toggle between AM and FM. The operating mode will be displayed next to the station frequency.

Press and release the seek up button (3) to search for the next station in either the AM or FM mode. Press and release the seek down button (4) to seek down. The radio will remain tuned to the new station until you make another selection.

Turn the TUNE/AUDIO control (5) to increase or decrease the radio frequency.

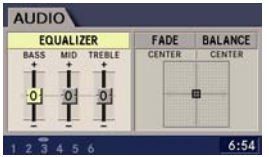
To mute the sound (both navigation and radio), press the MUTE button (6).

The system has 6 preset buttons (7).

To change the mode from AM/FM to CD, SAT, or VES, press the MODE button (8).

Press the INFO button (9) to view text information in FM and CD modes.

To set bass and treble levels and speaker balance and fade, press the TUNE/AUDIO knob (5) to access the **Audio** screen.



Setting Bass Levels – The Bass control adjusts the bass levels of the sound system. Press the TUNE/AUDIO knob to highlight "BASS". Turn the TUNE/AUDIO knob to set the desired bass level.

Setting Midrange Levels– The Midrange (MID) control adjusts the midrange levels of the sound system. Press the TUNE/AUDIO knob to highlight "MID". Turn the TUNE/AUDIO knob to set the desired midrange level.

Setting Treble Levels – The Treble control adjusts the treble levels of the sound system. Press the TUNE/AUDIO knob to highlight "TREBLE". Turn the TUNE/AUDIO knob to set the desired treble level.

Setting Speaker Fade – The Fade control adjusts the front and rear speaker balance. Press the TUNE/AUDIO knob until "FADE" is highlighted. Turn the TUNE/AUDIO knob to set the desired fade level.

Setting Speaker Balance – The Balance control adjusts the left-to-right speaker balance. Press the TUNE/AUDIO knob until "BALANCE" is highlighted. Turn the TUNE/AUDIO knob to set the desired speaker balance.

To exit the **Audio** screen, press the TUNE/AUDIO knob until the previous mode screen appears.

NOTE: The **Audio** screen will cancel out after 30 seconds of non use.

Setting the Radio Pushbutton Memory

When you are receiving a station that you'd like to set to memory, press the SET/RND button. "SET 1" appears on the display.

Select the "1-6" button you wish to lock on this station and press and release that button. If a button is not selected within 5 seconds of pressing SET/RND, the station will continue to play but will not be locked into pushbutton memory.

You may add a second station to each pushbutton by pressing the SET/RND button twice. "SET 2" appears on the display.

Each button can be set for SET 1 and SET 2 in both AM and FM. This allows a total of 12 AM and 12 FM stations to be locked into pushbutton memory. The stations stored in SET 2 memory can be selected by pressing the applicable "1-6" button twice.

Program Type (PTY)

The Program Type feature allows you to search for stations by category (i.e. country, classical, rock). The PTY feature only operates in the FM mode.

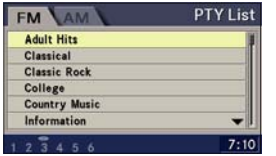
To view the program type of the current station, press PTY. If no action is taken within 5 seconds, the feature will turn off.

NOTE: If the station has no program type, "NO PTY" will be displayed.

NOTE: If a preset button is pressed while in the PTY mode the PTY mode will be exited and the radio will tune to the preset station.

To view the program type of each listenable station, press PTY and then immediately press the Seek Up/Down button. The system will go to the next available station, displaying that station's program type. The radio will remain tuned to this station until you make another selection.

To search for a specific music category, press PTY twice. A list of categories appears. Using the Select Encoder, select a category.



Press the Seek button to go to the next available station in that category. When the selected station is found, the search ends. To exit the PTY screen and return to the previous FM screen, press the CANCEL button or wait for 30 seconds.

FM Text Information

If the current FM station contains text information, “Info” is displayed under the station number. To view the text press the INFO button. The text, if available, will appear in the message box below the “Info” icon. To scroll down through the text, press the INFO button.

CD PLAYER OPERATION

NOTE: The ignition switch must be in the ON or ACC position and the radio power turned ON before the CD player will operate.

WARNING: *Always check the CD player for discs before inserting another disc. Failure to do so may cause damage to the system.*

Your system is equipped with a CD changer that holds 6 CDs. At the bottom of each radio display screen you will see the numbers 1-6. When a CD is in the changer, a round disc will appear over the corresponding number.

For example, if you have a CD in the third slot, you will see a disc over the number 3. Each slot is matched to a corresponding preset button.

Inserting a CD

Press the LOAD button. Press the preset button of the corresponding CD slot. When the message at the bottom of the screen reads "Please Insert Disc", hold the disc to the CD insertion slot. The CD player will pull the CD into the system—do not push the CD into the player.

You may insert a disc with the radio off. If the radio is on, the unit will switch from radio to CD mode and begin to play when you insert the disc. The display will show the track number and index time in minutes and seconds. Play will begin at the start of Track 1.

Ejecting a CD

Press the LOAD button. Press the preset button of the corresponding CD slot. The disc will unload. If you do not remove the disc within 10 seconds, it will reload and begin to play.

A disc can be ejected with the radio and ignition off. To eject all CDs from the player, press and hold the LOAD button for 5 seconds.

Play Options

Press and hold the Seek button to fast forward or rewind a track. To stop fast forward or rewind, release the Seek button.

Press the forward Seek button to go to the next track on the CD. Press the back Seek button to return to the beginning of the current track, or return to the beginning of the previous track if the CD is within the first second of the current track.

Press the SET/RND button while the CD is playing to activate Random Play. This feature plays the selections on the compact disc in a random order. Press the forward Seek button to move to the next randomly selected track. Press the SET/RND button a second time to stop Random Play.

If the current track contains text information, “Info” is displayed under the track number. To view the text press the INFO button. Text information, if available, will appear in this order:

- Song Title
- Artist
- Album

To scroll down through the text, press the INFO button.

To return to AM/FM mode, press the AM/FM button. This will halt CD operation. To return to CD mode, press the MODE button. The CD will resume from the point at which it was stopped.

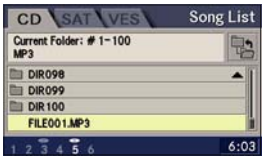
Playing an MP3 Disc

The MP3 screen shows track number, elapsed track time, and current folder name (if available), and allows you to view the list of songs in the current folder.

If the current track contains text information, “Info” is displayed under the track number. To view the text press the INFO button. Text information, if available, will appear in this order:

- File
- Song Title
- Artist
- Album
- Genre

To scroll down through the text, press the INFO button.



To view the songs in the song list, highlight "Song List" and press ENTER. A screen displaying the folder and file structure of the MP3 disc appears. To view the songs in a folder, highlight the folder and press ENTER. To listen to a song in the folder, highlight the song and press ENTER. The selected song will begin to play.

Highlight the "Folder Up" icon in the upper right corner to view the parent folder of the current folder or file.

To play all the tracks in the current folder only, highlight "Repeat Folder" and press ENTER. To turn Repeat Folder mode off, highlight "Repeat Folder" and press ENTER. The red checkmark will disappear.

Press SET/RND to play all songs in the current folder randomly.

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Your Navigation Radio is compatible with a number of add-on options. This section describes how these options interface with the Navigation Radio. Please see the product owner's manual for complete operating instructions.

Satellite Radio

If you have purchased the Satellite Radio option (available through your Sterling dealer), you will have access to over 100 satellite channels of music, information, and entertainment programming.

Activation

In order to activate the satellite radio, you will need to call the satellite radio service provider and give them an electronic serial number (ESN). This number is located on a special diagnostic screen of the navigation radio. To find this number, follow this procedure:

1. ACC on, power off.
2. Press and hold the LOAD and SET/RND buttons at the same time.
3. A diagnostic screen appears. Find the ESN on the screen and write it down.
4. Call the satellite radio service provider (refer to the satellite radio owner's manual) to activate the system.

Controls and Pushbuttons

MODE

press the MODE button until the SAT folder is active.

TUNE
Turn the TUNE/AUDIO knob to select Satellite channels OR press the forward/back Seek buttons.

INFO
The channel name and the channel number will automatically be displayed on the screen. To view any additional information, press the INFO button. Text information, if available, will appear in this order:

- Song Title
- Artist
- Album
- Label
- Composer
- Alt. Artist
- Comments
- Promo Text

To scroll down through the text, press the INFO button.

SET/RND
When you are receiving a station that you'd like to set to memory, press the SET/RND button. "SET 1" appears on the display. Press and release the "1-6" button you wish to lock on this station. If a button is not selected within 5 seconds, the station will continue to play but will not be locked into pushbutton memory in the satellite radio unit.

You may add a second station to each pushbutton by pressing SET/RND twice. "SET 2" appears on the display. A total of 12 satellite radio stations can be locked into pushbutton memory. The stations stored in SET 2 memory can be selected by pressing SET/RND twice.

Program Type (PTY)
The channel number and station name are automatically displayed on the screen. The PTY name is shown under the station name for 5 seconds after the new station is received. To view the channel name again, press the PTY button.

The PTY feature allows you to search for stations by type of category (i.e. country, classical, rock, news). Press PTY twice. A list of categories is displayed. Use the Select Encoder to select a category. Press the SEEK up or down button to tune the unit to the next station that broadcasts the chosen program type.

Hands Free Module (HFM)

The Hands Free Module feature allows you to make and receive hands-free, voice-activated cellular phone calls in your vehicle. It is available only when the vehicle is equipped with UConnect®.

The display will change from an audio screen or navigation menu screen to the HFM full screen when the HFM is activated through an incoming or outgoing call. If the HFM is active and the radio power is turned off, the HFM full screen will be displayed.

If a navigation route is active, the call information will be shown at the bottom of the **Map** screen. To go to the HFM full screen, press the AM/FM or MODE button. When the HFM is no longer active, the screen will return to normal.

When the HFM is active, the audio output will be muted and these functions will not be available: Mute, seek, tuning, setting stations, PTY seek, Disc up/down, presets, and audio settings.

Calling a Point of Interest (POI)

When you're operating the navigation system and your destination is a POI, you can call that destination from the **Confirm Route To** screen.

1. From the **Confirm Route To** screen, use the Select Encoder to highlight the "CALL" button and press ENTER.

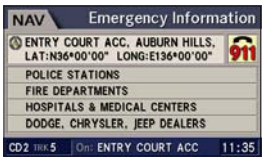
NOTE: If the destination is not a POI the "Call" button is grayed and unavailable.

2. The HFM will be activated and a call will be made to the POI.

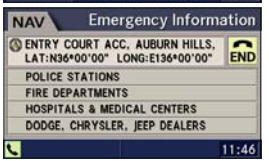
3. To end a call, highlight the "END CALL" button and press ENTER.

Calling 911

1. At the navigation **Emergency Information** screen use the Select Encoder to highlight the "911" icon. Press ENTER.



2. To end the call, highlight the "END" icon. Press ENTER.



FREQUENTLY ASKED QUESTIONS

- **How do I go to a previous screen?**
  Press the CANCEL button.
- **How do I change the map size?**
  Use the Zoom function to increase or decrease the detail on the map. At the **Map** screen turn the Select Encoder and choose a level of magnification.
- **Why does the system show my vehicle position on the wrong road?**
  While the system uses multiple inputs to determine vehicle position, it does have an error window of approximately 35-100 feet (10-30 meters). If there is an adjacent road within these limits, the system may display your vehicle on the adjacent road. If this occurs, continue on your known calculated route. The system will eventually reposition you on the correct road.
- **Can I cancel a trip once the destination has been calculated?**
  Yes. Go to the **Main Menu** screen and select "Cancel Guidance" **OR** press the CANCEL button when you are at the **Map** screen.
- **Can I use the navigation software in my computer?**
  No. This proprietary software is devoted exclusively by Alpine for the sole purpose of navigation.
- **If the battery is disconnected will I lose my saved settings?**
  The system will save ONLY the address book and recent route list. All other preset information will revert to their default positions and will have to be reset.
- **What happens when I turn off the ignition?**
  All settings will be retained.
- **Why can't I find my home address on the map?**
  The DVD-ROM that is included with your system contains the most recent map data available at the time of production. However, there are situations when homes may not yet be in the database (i.e. newly developed neighborhoods, homes located off dirt or country roads, etc.).
- **Is there a way to view a list of the route directions?**
  You may view the turn-by-turn instructions for your route by selecting "Route Options" from the **Main Menu** screen.

- **Does the Navigation System display my position in terms of True North or my direction of travel?**
  Both. You can choose between displaying North Up or your direction of travel. (See "System Settings" for details.)
- **Can I control the type of guidance prompt?**
  Yes. You can select from 4 different options: Off, Voice, Tone, or Voice & Tone. Go to the **System Settings** menu and select "Guidance Setup". Highlight "Prompt" and press ENTER.
- **When I search POI by place name (i.e. McDonald's), it shows multiple entries with the same name but with different categories. What do I do?**
  Choose the category that best fits your selection criteria. A list will appear that will show the nearest locations.
- **I cannot find a phone number in the database.**
  The database is not inclusive of all businesses in the US. Personal or household phone numbers are not listed to respect each individual's privacy.
- **What if I don't have the address of my destination but I do have the phone number?**
  You can search for your destination by phone number, but ONLY if it is a business phone number or a phone number that is stored in your address book. If you know the street names you can search by intersection.
- **When I drive over a rough road the CD player skips. Will this damage the CD or player?**
  No.
- **I don't want to listen to the radio while navigating. Can I turn off the radio and still navigate a route?**
  Turning off the radio would also turn off the Navigation System since the on/off knob controls both the radio and the navigation system. You can, however, turn the volume of the radio down to the lowest level. You will no longer hear any sound. You will, however, still hear navigation voice commands.
- **Can I play CDRs (recordable CDs) and CD-RWs (rewritable CDs) in the CD player?**
  Yes. Most CDRs and CD-RWs should play.

FREQUENTLY ASKED QUESTIONS

- **Does the Navigation System play DVDs?**
  No. The DVD-ROM that comes with the system is the **ONLY** DVD that will work.
- **How often is the DVD disc updated?**
  The DVD disc is updated at least once per year. To inquire about release dates, call 1-866-733-5492.
- **How much does the DVD disc cost?**
  The software used in a navigation system is very specialized. The price of software includes royalties and development charges. The cost of each software update is $150 per DVD-ROM plus tax and shipping and handling.
- **Why do I need to update my DVD disc?**
  Updating becomes necessary as coverage areas continuously change and expand. Each update contains new data base information: addition of new cities/areas, new POI information, new construction, new developments, road changes, etc. In addition, a new disc release may include enhancements to the operating software that will upgrade the performance and/or the graphics of the system.
- **What's the best way to let you know about any system problems I may encounter?**
  If you have any questions on the operation of your system that are not covered in your Owner's Manual, feel free to contact our Customer Service Department at 1-866-733-5492. This service is available Monday through Friday from 9:00 am to 5:00 pm (Eastern Standard Time).
- **How do I report incorrect database information?**
  To report database discrepancies or to make a database request, fill out a Driver Feedback form at the NavTech@ website at http://update.navtech.com/.

Symptom	Cause	Solution
The vehicle position is displayed incorrectly on the screen.	The vehicle position changed after the ignition was switched off: • Movement on a ferry boat • Rotation of a parking lot turntable • Movement by a tow truck	Drive the vehicle in an area of good GPS reception to allow the unit to recalibrate.
	Poor satellite reception caused by the obstruction of satellite signals (tall buildings, tunnels, indoor parking lots, mountains)	Move to a location where strong GPS reception is possible.
	Not enough satellites to give three-dimensional positioning	
The system doesn't recognize my destination name.	Incorrect spelling	Re-enter name with correct spelling.
	Name isn't entered correctly (i.e. missing an apostrophe, dash, space, hyphen)	Re-enter exact name.
An audible chime sounds 2 times upon turning the ignition key to the ON/RUN position and the radio is powered on.	The GPS antenna has been disconnected	Press the NAV button. "GPS antenna is disconnected" is displayed. See your authorized Sterling dealer for antenna connection.
	The Navigation DVD is not installed	Press the NAV button. "Please insert DVD-ROM" is displayed. Insert the DVD.

TROUBLESHOOTING—RADIO

Symptom	Cause	Solution
No operation/no display	Moisture condensation	Allow the condensation to evaporate (about 1 hour).
	Temperature in vehicle is too hot	Lower the temperature in the vehicle: • Open vehicle windows • Turn on air conditioner
	Blown fuse	Replace with a fuse of the prescribed rating.
Error reading disc	System cannot read the inserted disc	Insert another disc
	The disc is dirty	Clean disc.
	The disc is inserted improperly	Eject disc and reinsert right side up.
	The disc cannot be read because of condensation	Allow condensation to evaporate (about 1 hour).